

**Before the
COPYRIGHT ROYALTY BOARD
LIBRARY OF CONGRESS
Washington, D.C.**

In the Matter of

**Mechanical and Digital Phonorecord
Delivery Rate Adjustment Proceeding**

Docket No. 2006-3 CRB DPRA

**TESTIMONY OF MARGARET E. GUERIN-CALVERT
Submitted November 30, 2006**

Testimony of Margaret E. Guerin-Calvert

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Testimony of Margaret E. Guerin-Calvert On Behalf of Digital Media Association

I. Introduction and Overview

A. Background and Qualifications

1. I am President of Competition Policy Associates, a consulting firm in Washington, D.C. that specializes in antitrust economics and applied microeconomics, and Senior Managing Director of FTL. I am trained as an industrial organization economist, which is the branch of economics that involves the study of firms, industries, consumer behavior, and pricing. I have worked as an economist on issues related to competition and competition policy involving a variety of industries since 1979. During this twenty-seven year period, I have reviewed a large number of competition issues and cases, including many mergers and claims regarding market power and market conditions, and served as an economist both in government and in the private sector. In addition, I have worked on a wide variety of issues involving assessment of industry conditions in network industries and electronic commerce, including assessment of joint ventures and innovation. I have worked on issues related to innovation and licensing, including in the music, financial services, and B2B context. Among other positions, I served as Assistant Chief of the Economic Regulatory Section at the Antitrust Division of the U.S. Department of Justice (“DOJ”) from 1990 to 1994, where I was responsible for supervision of mergers, civil case investigations, and regulatory filings in a wide array of regulated and unregulated industries. I also was a Principal at Economists Incorporated, where I worked on a number of matters involving evaluation of competition in a wide variety of industries.
2. I have written and edited numerous articles on industrial organization and competition policy, including network industries. I also co-edited and wrote chapters for a book on these subjects. I taught economics at the Institute of Policy Sciences at Duke University. I have testified as an economic expert in a number of court proceedings or administrative hearings, both in the U.S. and internationally. I have

testified before the Federal Trade Commission (“FTC”) and DOJ Hearings on Intellectual Property on issues related to incentives and innovation in network industries. My professional expertise, including my experience in testimony in the last four years at trial or deposition, is set out in detail in my curriculum vita, which is attached.

B. Retention

3. I have been retained by the Digital Media Association¹ as an economics expert to provide a recommendation to the Copyright Royalty Board (“CRB”) concerning the issues relevant for the setting of rates and terms for the making and distribution of digital phonorecord deliveries (“DPD”). Specifically, I was asked to conduct an economic study of the digital music industry and marketplace, specifically internet-enabled music services offering subscription and a la carte digital downloads, and to develop economic and empirical analyses relevant to analyzing the four objectives set forth in Section 801(b) (1) of the Copyright Act of 1976 for setting a compulsory rate for the licensing of DPDs. These four objectives are as follows:

- (A) To maximize the availability of creative works to the public;
- (B) To afford the copyright owner a fair return for his creative work and the copyright user a fair income under existing economic conditions;
- (C) To reflect the relative roles of the copyright owner and the copyright user in the product made available to the public with respect to relative creative contribution, technological contribution, capital investment, cost, risk, and contribution to the opening of new markets for creative expression and media for their communication;
- (D) To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.

¹ A listing of DiMA members can be found at www.digmedia.org

4. These four objectives set out a broad approach that requires evaluation of the incentives, technologies, market arrangements, and investments required not only to conduct marketplace operations but to provide for explicit maximization of available creative works. These standards are being applied in a marketplace where the actions on one side (e.g., in the form of copyright users' investments in marketing or development of technologies) have potential spillover benefits on the other side (i.e., copyright owners). These interrelationships mean the appropriate rate structure that achieves the relevant objectives is not necessarily one that yields increased short term compensation for copyright holders with attendant higher costs for users, but may instead be one that is lower but promotes long run sustainable growth and compensation in the industry.
5. Assessment of the four objectives involves application of standard principles of economic analysis to the digital music industry, taking into account market participants (including, for example, copyright holders), information on development of technologies at various levels of the industry, and the interplay of digitally distributed music works with other forms of music distribution.

C. Basis for Opinions Offered

6. My opinions, which are based on my work to date, are presented in the remainder of this report.² My opinions expressed herein are based on my knowledge and experience in industrial organization economics, including evaluation of industry conditions, pricing, and innovation. Economists and economic analyses provide useful means to assess issues involved in this matter, including assessment of the structure and evolution of industries and products, and the importance of incentives to innovate and develop products, to make investments, and to market to and attract customers in market contexts with competing and nascent technologies. The industry is still in the early stages of development, with competing firms undertaking

² I have been compensated for my work on this matter at my usual and customary rate of \$675 per hour, and have been assisted by staff at Competition Policy Associates in the customary manner for a matter of this type.

considerable investments in a variety of technologies and strategies, where market demand and consumer acceptance of technologies and products are still evolving and where piracy is a significant factor. In this report, I have attempted to set out the basic industry conditions and to identify the key trends and economic factors relevant to the assessment of the issues before the CRB.

7. In conducting my analyses of the issues I made use of my experience as well as extensive review of information and economic literature as is customarily done by economists. I examined a large array of materials on digital and physical delivery of music provided by several DiMA members³ as well as my own independent research. I reviewed relevant academic literature on copyright and intellectual property licensing, as well as on innovation, pricing, and development of competing technologies or products, including in network industries. I also examined the last time the statutory objectives were applied to set a rate under Section 115, in the 1980/81 proceedings before the Copyright Royalty Tribunal, as well as interim arrangements or settlements.
8. Although I consider the work I have done to be sufficient for me to render these opinions, I may supplement or modify my opinions based on any additional information that I receive. I also reserve the right to respond from an economic perspective to other filings in this matter subsequent to the filing of this report.

D. Summary of Conclusions

9. Based on my empirical and economic analyses, the following are my preliminary conclusions:
10. *The digital music industry represents a fundamental change in the mode of delivering music content.* Digital music companies have expanded the availability and appeal of royalty-bearing creative works in a manner that is truly revolutionary. Substantial investments and innovation, undertaken at considerable risk, have been

³ As is detailed further in this report, I received a variety of different types of materials from various DiMA members, including profit and loss information and information and data with regard to accounts and subscribers as well as catalogue size and composition.

required to develop market-based mechanisms for delivering and marketing content to the ultimate consumer. A wide range of different business models have attempted to meet consumer demands and the industry is still evolving in structure and format. There is no one long-term clear technology of choice. The industry continues to evolve with new partnerships and technologies, and with price sensitivity at the consumer level. As a general matter, profitability is still volatile and uncertain given consumer choices and the need to adapt to a variety of industry pressures, including the availability of free music from pirate sites.⁴

11. ***The flexibility of digital media has presented opportunities as well as challenges for industry participants, including major marketing challenges to educate consumers about the use of new technologies and methods.*** Music piracy represents major challenges in terms of price sensitivity and competition. At the same time, digital sales have expanded considerably the depth and breadth of catalog offerings in the marketplace and the range of offerings from independent, newer, and diverse copyright owners. All available measures indicate that the industry in its early stages is substantially expanding the diversity of music offerings and expanding the ease with which diverse and less well known musical works are able to reach consumers. This early success, however, has not necessarily been accompanied by profitability and financial stability for the purveyors of digital music, nor does the sale of music via digital media represent a substantial share of overall purchases.
12. ***Growth in the digital pie has substantial spillover benefits for copyright holders, who will gain in the legitimate market sale of their music, and particularly to expand the scale and the scope of offerings relative to traditional CDs.*** The expansive depth and breath of music catalogs available to on-line digital music consumers benefits copyright users as well as copyright owners. Usage data show that consumers effectively access the full catalog of music, including older, more

⁴ In this report, I use the terms non-royalty bearing, unauthorized, pirate, and illegal to distinguish from the concept of songs that can be sampled or acquired for free without cost as promotions on legitimate digital music sites.

obscure music, and cumulatively these less frequently accessed tracks account for a substantial portion of downloads and plays.

13. *Some of the digital music industry participants are co-located with other business enterprises, which may in some instances, facilitate the ability to market and promote products and to provide some financial stability for new ventures.* At the

same time, the co-existence of partners and divisions has not reduced the need for substantial marketing and promotional efforts to increase consumer comfort with new marketing methods and the importance of investments in technology, R&D, and costs. Royalty costs continue to be a substantial portion of costs for an industry where consumer pricing reflects the fact that many products and services are largely still in their introductory phases and the largest music catalog is otherwise available for free on pirate websites.

14. Review of data and information on investments, profit and loss statements, the challenges facing the industry in terms of developing additional technologies and partnerships for download and portability and for expanding subscription services, demonstrate that the rate structure and level set in this proceeding need to take into account ongoing substantial investments in marketing and research, as well as uncertainty associated with consumer acceptance and choice.

15. Based on my review of the economic evidence and application of the four objectives set forth in this proceeding, it is my view that the rate structure and methodology must satisfy the following principles:

- It must be sufficiently flexible to account for a variety of business models, uncertainties and financial risks associated with the ongoing evolution and development of the industry, and the need continually to invest substantial monies to market digital music;
- It must take into account the high level of consumer price sensitivity for digital music in its various forms while continuing to provide the relevant incentives for copyright owners and other participants to develop and

expand the creative works available and compensate fairly on an ongoing basis. Price sensitivity is relevant for analysis of the rate level as well as any proposed minimum rates, which if used and set too high could disrupt expansion and growth, and thereby potentially limit substantially the gains to all market participants. These risks are sufficient that minima should be avoided.

- The rate structure should take into consideration the elements considered in the 1980/81 decision but must also account for fundamental differences that may exist in industry conditions.

16. Application of these principles leads me to the following preliminary recommendations with regard to rate structure and rates:

1. The proposed rate should be based on a percentage of retail revenues and not a per unit basis. A percentage of revenue structure provides a mechanism to allow for copyright users and owners to share in the actual gains from expansion of digital sales, while allowing for a cost structure that promotes such expansion and financial viability. A percentage of retail revenue approach is a preferred approach as well for the longer term duration of the compulsory rate under consideration in this proceeding because it effectively adjusts over time.
2. The revenue measure should capture actual revenues from the sale of music subject to Section 115. The appropriate revenue definition should meet the principle that it allows for different sources of revenue, but should not be so broad as to encompass adjacent but not directly related businesses or revenue sources. This is particularly important since several digital music businesses are part of larger enterprises and the principle should be applicable across all companies.
3. The setting of the rate level should take into consideration the fact that royalty costs account for a considerable proportion of overall costs for digital music

firms. Thus, setting a rate at a level appropriate for achieving a fair income for the copyright holders while achieving the other three objectives suggests that a rate in the 4% to 6% of retail revenue range, most appropriately at the lower end of that range, would better achieve the four objectives. With regard to the percentage of revenue, I note that the rate structure as of 1980/81 would have generated approximately a 5% of retail revenue estimate at its implementation. Moreover, 1980/81 was a more robust and less risky environment for the recording industry. A rate of in this range is also generally consistent with other arrangements I have reviewed although there is no exactly comparable circumstance.

4. Differences between permanent and conditional downloads are relevant to the appropriate rate structure and support an incremental and not significant difference in rates, subject to the overarching principle of a rate that is at the low end of the range. First, the ownership rights that are conveyed by permanent downloads are more similar to physical CDs than to conditional downloads. Second, conditional downloads are a more nascent form of consuming digital music and represent riskier business models. They require consumer acceptance of the concept of on-line consumption *and* non-permanent ownership.⁵ Third, the potential exists for “copyright stacking via multiple rights” in the current environment of legal uncertainty over what rights are conveyed. Overall, subscription services also reduce the risks of copyright owners by spreading the risk of investment across the entire catalog as well as across users. Differential rates would still afford substantial compensation for copyright owners while promoting expansion of creative works and the digital music industry as a whole. Empirical testing of the dollar royalties from rates in the 4-6% range and inclusive of a differential

⁵ This leads to the need to overcome the potential negative consumer perception that the choice of conditional downloads would require “starting all over from scratch” if the consumer chose to leave the subscription service and thereby lost access to the downloads previously obtained on a conditional basis, whereas with permanent downloads, the customer can enter and exit the marketplace seamlessly.

demonstrates that rates in this range would provide substantial returns to copyright owners and adequate compensation to the industry participants.

5. Based on my analysis to date, I conclude that a minimum royalty rate would not advance the objectives of Section 801(b) (1). Per unit minima pose substantial risks to entry and expansion of firms, particularly given the uncertainty about successful technologies and continued pricing sensitivity due to piracy and the availability of free music. A percentage of retail revenue standard should provide sufficient and predictable compensation to copyright holders to satisfy the fair return standard without recourse to minima.
17. This rate structure satisfies the four objectives by providing fair compensation and adequate returns and maximization of creative works with the least potential for disruption in the industry. The rate structure and levels proposed by DiMA in this proceeding are consistent with the principles summarized above and developed in this report.

E. Structure of the Report

18. The report is organized in the following way:
19. In order to provide background and context for the current proceeding, I first reviewed the application of the four objectives to marketplace facts and conditions as set out in the 1980/81 decision, and examined the factors and conditions relevant to that decision. I then examined the evolution of the digital marketplace since 1980/81, and in particular, the development of the digital music industry that is the subject of this proceeding. This analysis is set out in Section II. In Section III, I develop the principles underlying a rate methodology that satisfies the four objectives, and present recommendations for a rate methodology and the supporting analyses.

II. Economic Analysis of the Digital Media Industry Conditions

A. Introduction and Overview

20. As a starting point for my analysis, I reviewed both industry conditions and factors affecting licensing and mechanical royalties addressed in the 1980/81 proceedings and ultimate decision.⁶ These proceedings are relevant in that they were the last time the statutory objectives had been rigorously applied and upheld on appeal in connection with the license at issue in this proceeding. My purpose was to examine the factors that were considered, the standards as they were applied, and the state of the recording industry and copyright owners in 1980/81. I also examined other arrangements that have been reached with regard to mechanical royalties since 1980. These provide useful background and context for my economic analyses of the current developments in the industry.⁷
21. From an economic perspective, developing a rate and rate structure sufficient for achieving the four objectives set out for this proceeding involves an economic evaluation of the market developments and market factors that affect the incentives and ability of market participants to provide content and technologies for developing, marketing, and delivering creative music works to consumers. This is particularly important since the rate methodology will apply not just for the immediate period but must have sufficient flexibility and scope to address developments and incentives for a longer period (e.g., perhaps five years). Crafting the appropriate structure and

⁶ “Adjustment of Royalty Payable Under Compulsory License for Making and Distributing Phonorecords; Rates and Adjustment of Rates,” 46 FR 10466 (Feb. 3, 1981), *aff’d* in part and *rev’d* and remanded in part, 662 F.2d 1 (D.C.Cir. 1981).

⁷ I also obtained and reviewed information on other proceedings, current licensing agreements in the digital music industry, and recent settlements in the U.K. involving multiple copyrights. While these agreements and licensing arrangements are informative and provide insight into the nature of the terms and conditions that participants to a two-sided contract or settlement agreement can reach, I emphasize that each have some conditions or circumstances that are specific to the context or to the participants, and were reached in a context different from the one before the Board, which includes the fulfillment of the four specific objectives. For example, agreements outside of the U.S. have different durations and a different package of property rights, among other differences.

methodology for rates from an economic perspective entails recognition of the fact that in developing industries and technologies with a variety of business models and strategies, the methodology must be such so as not to favor particular technologies nor substantially disadvantage others.

22. This section sets the stage for development of a rate recommendation by providing an overview of the key industry developments. The following sub-sections address:

- The 1980/81 decision (and related arrangements)
- Major trends in the industry, including the development of new technologies and business models
- The role and influence of piracy in the development of new technologies
- Implications of digital media for the depth and breadth of catalog and distribution of creative works
- Factors affecting the growth, cost and development of the digital media business

B. Summary of Key Elements of the 1980/81 Section 115 Application of the Standards

23. As background for my analysis, I reviewed information from the 1980/81 proceedings before the Copyright Royalty Tribunal concerning the setting of the compulsory license for the use of non-dramatic musical works in the making of phono-recordings (also referred to as mechanical royalties).⁸ In particular, I reviewed the Tribunal's application of the four statutory objectives to the evidence in the record before them in 1980/81. While industry conditions have clearly changed dramatically since the early 1980s, there are several aspects of the earlier proceedings with regard to the

⁸ "Adjustment of Royalty Payable Under Compulsory License for Making and Distributing Phonorecords; Rates and Adjustment of Rates," 46 FR 10466 (Feb. 3, 1981), *aff'd* in part and *rev'd* and *remanded* in part, 662 F.2d 1 (D.C.Cir. 1981).

four objectives and the analyses presented and reviewed that remain relevant. The following summarizes some key elements:

- The Tribunal found that the existing rate should not be accorded precedential weight and that the Tribunal's objective was to set a reasonable rate on the basis of the record before it and one calculated to achieve the statutory objectives.⁹
- The Tribunal confirmed that Section 115 was directed towards compulsory licensing of individual songs, on a per-unit rate basis, by individual record label, after one-on-one negotiations with a copyright owner have failed.
- The Tribunal stated that a reasonable adjustment to the statutory rate should ensure the "full play of market forces, while affording individual copyright owners a reasonable rate of return for their creative works."
- The Tribunal concluded that the fair return due to copyright owners applies to songwriters as individuals, not as a group.
- The Tribunal also found that copyright users rarely invoke the compulsory license under Section 115 and used the royalty rate as a ceiling in negotiations.
- In addition, the Tribunal found the volume of sales and size of the U.S. market to be a justifiable reason for distinguishing the higher rate set in Europe relative to the U.S. compulsory rate.¹⁰

⁹ The Tribunal agreed with the recording industry that a compulsory rate set deliberately above the level the market could bear with the subsequent purpose of allowing for negotiation of a lower rate was not reasonable and would result in higher returns to the copyright owners than required by the statutory objective.

¹⁰ In addition, mechanical royalties were found to be a small portion of record companies' costs, particularly relative to costs that were under the control of the labels.

- The CRT set the compulsory rate at 4 cents per track, or approximately 5.0% of the retail price, assuming a physical album retailing at \$7.98 and 10 tracks per album.¹¹

24. With regard to application of the four objectives, the key findings of the Tribunal from my perspective were that:

- copyright users (principally the recording labels) comprised a stable and mature industry with relatively little risk of disruption from the range of proposed rates (although it found that setting too high a rate would be inappropriate);
- the industry had been able to increase the prices of the physical product;
- there had been some inflationary trends that had been reflected in prices and profits but not necessarily in returns to copyright holders.
- particularly relevant to this current proceeding, in my view, was the Tribunal's conclusion that there had been some ability to pass along costs through increased prices and that there were relatively low predicted financial or other risks associated with the industry.

25. While I focused my primary review on the 1980/81 decision because it applied the same objectives involved in this proceeding, as additional background, I also reviewed arrangements reached concerning mechanical rights in 1997¹² and 2001, and recent UK settlement agreements with regard to certain rights.^{13,14,15}

¹¹ The 1981 CRT stated, "We determined that an increase in the mechanical royalty rate to four cents would produce a 40 cent royalty on a record listed at \$7.98." 46 FR 10466 at *10481.

¹² The 1997 rate settlement occurred after Congress enacted the Digital Performance Rights in Sound Recording Act ("DPRA") of 1995, which extended Section 115 to digital phonorecord deliveries. A central aspect in the 1997 Mechanical and Digital Phonorecord Delivery Rate Adjustment Proceeding Final Regulations was the determination that any future Section 115 proceeding for establishing the compulsory rate for DPDs in general was to be *de novo* with no precedential effect given to the rates established in the 1997 proceeding. DPRA set

26. With regard to these most recent arrangements, two settlements were reached in the U.K. —the first between music publishers and copyright users iTunes and several mobile service providers, and a second agreement between music publishers and subscription services, MusicNet and Napster.¹⁶

the compulsory rate for DPDs at the physical rate for deliveries on or before December 31, 1997 and set up either voluntary negotiations or CARP proceeding for subsequent periods. The parties reached a voluntary agreement on the compulsory rate for DPDs, which was submitted to the Library of Congress in November 1997. After initial comments, a new round of negotiations ensued with an agreement emerging that set the rate for DPDs in general, and DPDs involving “incidental” use of recordings to be established later. I note that the settlement agreement was reached outside the application of the Section 801(b) (1) objectives. The rate was set at 6.95 cents or 1.3 cents per minute or fraction thereof, whichever is larger, for deliveries on or before December 31, 1997. The rate of deliveries on or after January 1, 1998 was set at the physical rate. The 1997 rate was approximately 5.3% of the retail CD price, slightly above the rate set in the 1981 CRT decision.

¹³ In 2001, some digital media firms reached agreements with music publishers for mechanical licenses, with the terms modeled on an agreement reached by RIAA, but still subject to the ultimate outcome of this proceeding. RIAA negotiated a mechanical license that applied to subscription services and covered on-demand streaming and limited downloads. The agreement did not set a royalty rate, but deferred to negotiations and/or an arbitration proceeding before the Copyright Office. In the interim, the RIAA agreed to pay nonrefundable advance payments of \$1 million for two years, and \$62,500 per month (subject to adjustment) thereafter, until a royalty rate could be set. These payments would be recouped against any royalties owed under a negotiated or statutory license. “Summary of Agreement Between RIAA, NMPA, and HFA,” October 10, 2001. All digital music providers have negotiated individual agreements with HFA, which include payment of separate advances.

¹⁴ Napster, formerly known as *pressplay*, reached an agreement with the NMPA, HFA, and The Songwriters’ Guild of America. The terms included an advance against future licensing royalties of \$10 million. “Napster, Songwriters, and Music Publishers Reach Landmark Accord for Proposed Settlement and Licensing Agreement,”

<http://www.nmpa.org/pressroom/showrelease.asp?id=60>.

¹⁵ “Listen.com to License Music from HFA,” November 14, 2001, <http://www.internetnews.com/bus-news/article.php/923921>. Lastly, FullAudio, now owned by AOL/MusicNow, reached an agreement with HFA to license its digital music subscription service in April 2002. The terms were modeled on the agreement reached with the RIAA.

¹⁶ These arrangements included provisions for royalty rates for a bundle of rights broader than those under consideration in this proceeding and were reached as a settlement, rather than the application of standards such as are relevant here. The provisions included percent of revenue rates and per sterling pound minimums for permanent downloads and for subscription services.

27. I also examined the application of Section 801(b) (1) objectives to other proceedings, specifically the 1980/81 jukebox decision Section 116 proceeding¹⁷ and the 1998 digital performance of sound recordings Section 114 proceeding.¹⁸ In applying the first objective in the jukebox decision, the CRT affirmatively acknowledged that nothing in the record would justify a reasonable concern that the rate adopted would deprive the public of access to music. In the latter proceeding, the Register affirmatively acknowledged, and the Librarian concurred, that the law requires that a reasonable rate be set that minimizes the disruptive impact on the industry.
28. Central to the 1980/81 Section 115 decision as well as to the issues before the CRB today are the implications of the chosen rate methodology for the accomplishment of the four objectives. In order to be able to determine the attributes of a rate structure and methodology that achieve these objectives, it is important to consider and evaluate conditions in the marketplace. The following sections set out that analysis.

C. Changes in the Music Distribution Marketplace Since 1980

29. As is widely recognized, the making and delivery of mechanical reproductions of “phonorecords” today is fundamentally different from the industry in 1980/81, and in fact is substantially different in 2006 than it was in the early to mid-1990s. The media at issue in the 1980/81 proceeding were physical reproductions of musical works, specifically vinyl albums, vinyl singles, and to some extent audio cassettes. In fact, audio cassettes did not outsell vinyl until 1984, the same year that CDs, the first form of digital music, entered the marketplace. CD sales did not outpace cassette sales until 1992, but have effectively now all but replaced cassette sales.¹⁹

¹⁷ “1980 Adjustment of the Royalty Rate for Coin-Operated Phonorecord Players,” 46 FR 884 (Feb. 4, 1981), *aff’d* 676 F.2d 1144 (7th Cir. 1982)

¹⁸ “Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings,” 63 FR 25394 (May 8, 1998), *aff’d in part and rev’d and remanded in part*, 176 F.3d 528 (D.C.Cir. 1999).

¹⁹ See General Appendix for charts and graphs detailing these sales trends.

30. The digital industry is at a nascent stage, with competing and differentiated technologies and standards, and with a diverse set of business models for the sale of digital music. Sale or distribution through legitimate sellers of music is, however, not the sole means to acquire music digitally. The development of the industry has been hampered by the substantial issues associated with piracy and the fact that non-royalty bearing music is widely available. The widespread availability of such downloads reduces the revenues available for digital (and other sales), and means that digital media companies need to keep prices at very attractive levels to attract consumers; it also increases the pressures to develop sound market mechanisms and business models for legitimate sale.
31. The following sections examine the trends in the development of digital music starting first with the dramatic shift of sales from vinyl to CD and then a more moderate shift again to digital.

**1. Changes in the Format Media for Music Since 1980 – from Vinyl
to Cassette to CD to CD/Digital**

32. There have been fundamental changes in the format media for musical works since it was reviewed in 1980, with dramatic shifts in physical media, starting with cassettes, then CDs, and then most notably the beginnings of a shift to several methods for digital music distribution. The following table, from the RIAA, shows how dramatic the changes in distribution of music works have been even since 1990. In 1990, based on units shipped, there were no measurable digital works, and the majority of works were cassette sales. By 1996, cassette sales had declined to half of their 1990 volumes with a more than tripling of CD sales. Industry analyst Jupiter Research data suggest that baby boomers and the CD upgrade cycle may have caused music sales to increase to an “unnatural peak,” around 2000,²⁰ and that subsequent levels of CD

²⁰

US Music Forecast, 2005-2010, David Card, September 2005, p. 2.

sales may reflect a return to more “natural” sales levels.²¹ Cassette sales have declined to very low levels. On-line digital sales are shown for 2004 and 2005.²²

The Recording Industry Association of America's Year End Statistics, Units Shipped, 1990 to 2005
Sources: "1999YrEndStats RIAA", "2000YrEndStats RIAA", "2003YrEndStats RIAA", "2004YrEndStats RIAA", "2005YrEndStats RIAA"
Notes: Manufacturers' Unit Shipments and Dollar Value (In Millions, not after Returns)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<i>Physical</i>																
CD	286.5	333.3	407.5	495.4	662.1	722.9	776.9	753.1	847	938.9	942.5	881.9	803.3	745.9	766.9	705.4
CD Single	1.1	5.7	7.3	7.8	9.3	21.5	43.25	66.7	56	55.9	34.2	17.3	4.5	8.3	3.1	2.8
Cassette	442.2	360.1	366.4	339.5	345.4	272.6	225.3	172.6	158.5	123.6	76	45	31.1	17.2	5.2	2.5
Cassette Single	87.4	69	84.6	85.6	81.1	70.7	59.9	42.2	26.4	14.2	1.3	-1.5	-0.5			
LP/EP	11.7	4.8	2.3	1.2	1.9	2.2	2.9	2.7	3.4	2.9	2.2	2.3	1.7	1.5	1.3	1.02
Vinyl Single	27.6	22	19.8	15.1	11.7	10.2	10.1	7.5	5.4	5.3	4.8	5.5	4.4	3.8	3.5	2.3
Music Video	9.2	6.1	7.6	11	11.2	12.6	16.9	18.6	27.2	19.8	18.2	17.7	14.7	19.9	32.7	33.8
DVD Audio									0.5				0.3	0.4	0.4	0.5
SACD														1.3	0.79	0.5
DVD Video*										2.5	3.3	7.9	10.7	17.5	29.01	27.8
Total Physical	865.7	801	895.5	955.6	1122.7	1112.7	1137.2	1063.4	1124.3	1160.6	1079.3	968.5	859.7	798.4	814.1	748.7
<i>Total Physical to Retail Outlets</i>							833.9	817.5	850	869.7	788.6	733.1	675.7	658.2	686.9	634.8
<i>Digital</i>																
Digital Single															139.4	366.9
Digital Albums															4.5	13.6
Kiosk																0.7
Music Video																1.9
Total Digital															143.9	383.1
Mobile Subscription																170
																1.3
Total Digital & Physical	865.7	801.0	895.5	955.6	1,122.7	1,112.7	1,137.2	1,063.4	1,124.3	1,160.6	1,079.3	968.5	859.7	798.4	958.0	1,301.8

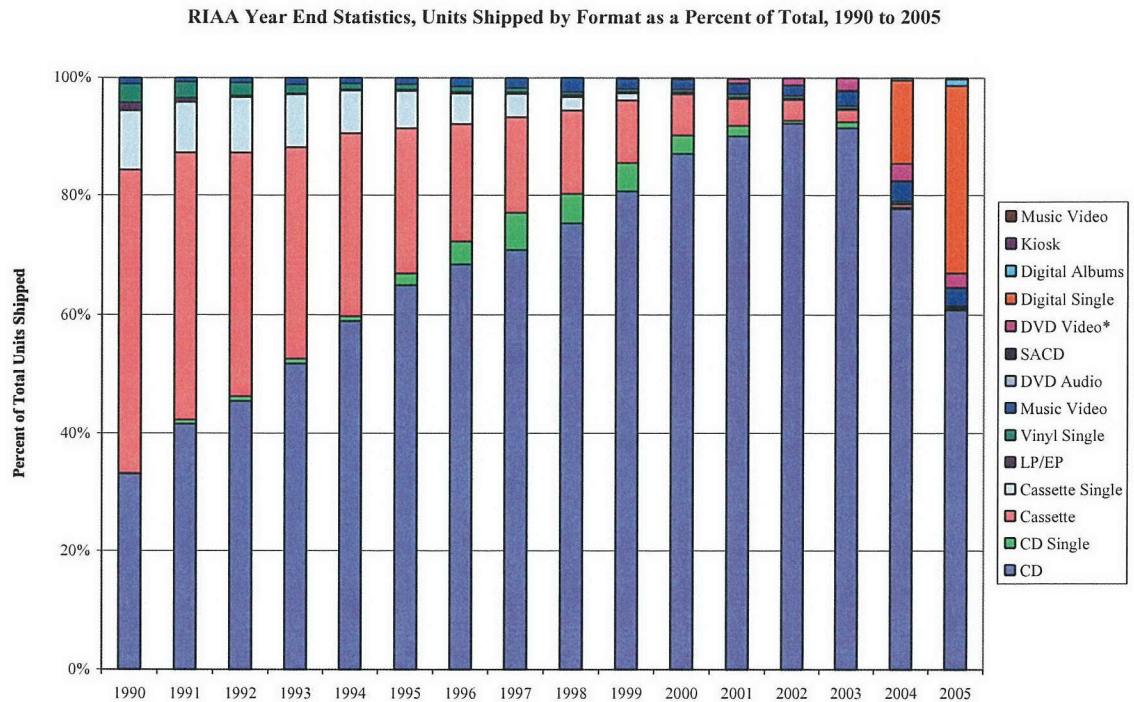
*Included in Music Video, but broken out for chart

33. This change in composition of sales is shown clearly in the following two graphical representations of the same data. The first chart shows the percentage of total units shipped by category (e.g., cassette, digital album or CD) for 1990 to 2005 and the second shows total units per year. The percentage distribution shows the rapidly increasing percentage of total units accounted for by CDs, increasing from less than

²¹ Reduced sales of CDs could also be accounted for by diversion to free and/or illegal downloads of music.

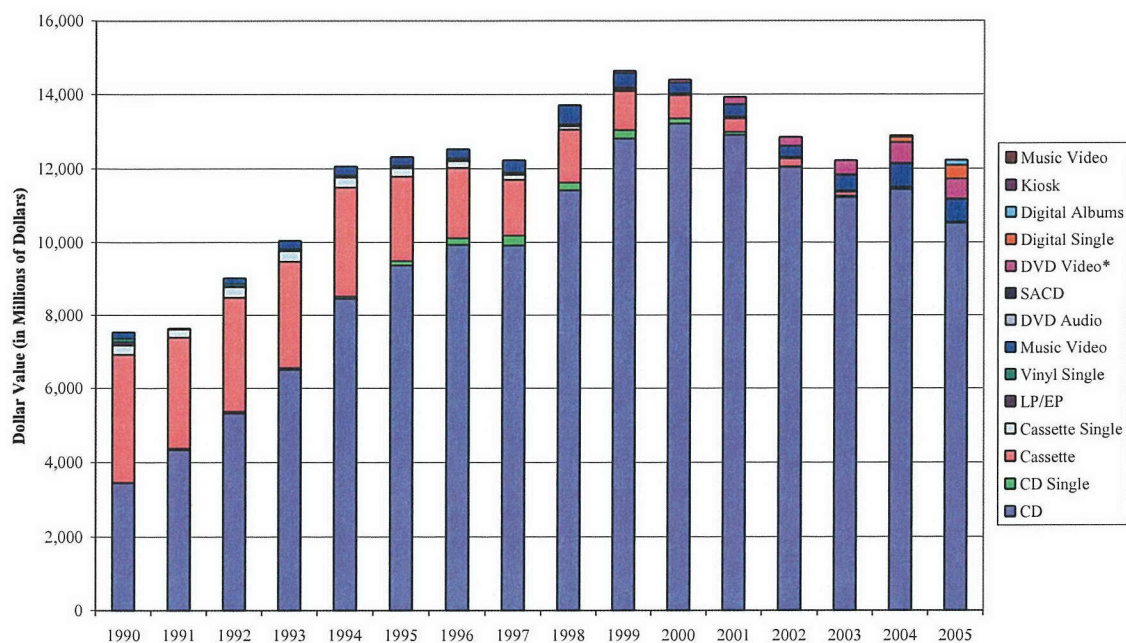
²² While the numbers are summed on the table for digital works and physical works, it should be noted that the units are not comparable – digital units are primarily single songs while physical CDs and other physical forms of music are typically collections of songs.

40% in 1990 to over 90% in 2000 and 2001. It also highlights the exit of various modes, such as cassette singles, which represented over 5% of sales in earlier periods.



Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

RIAA Year End Statistics, Dollar Value by Format, 1990 to 2005



Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

34. The dramatic shifts in physical units toward CDs, which commenced prior to 1990 but accelerated thereafter, and the subsequent increase in digital distinguish the current period from the 1980/81 period, where there was a relatively static and mature industry with a known and accepted format for music.
35. Another useful measure of the trends, which adjusts somewhat for the single vs. multiple song format measurement issues, is dollar sales by category. This measure, which is reflected in the table below, shows that the additional revenues from digital sales have been low in comparison to total sales of music.

The Recording Industry Association of America's Year End Statistics, Dollar Value, 1990 to 2005
Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"
Notes: Manufacturers' Unit Shipments and Dollar Value (In Millions, not after Returns)

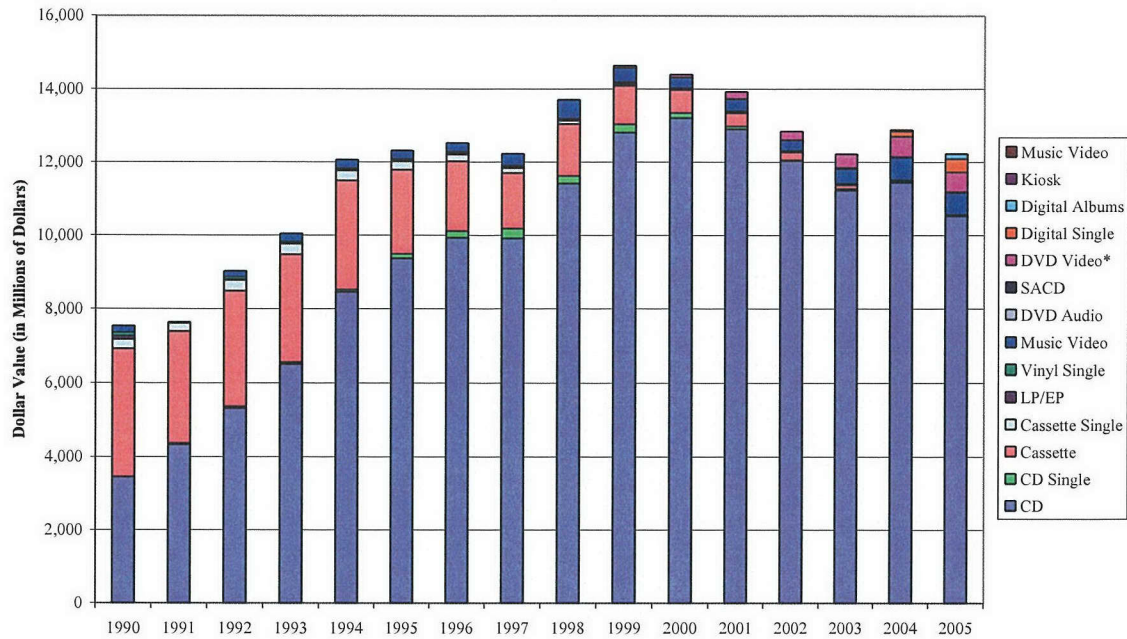
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<i>Physical</i>																
CD	3,432	4,338	5,327	6,511	8,465	9,377	9,935	9,915	11,416	12,816	13,215	12,909	12,044	11,233	11,447	10,520
CD Single	6	35	45	46	56	111	184	273	213	222	143	79	20	36	15	11
Cassette	3,472	3,020	3,116	2,916	2,976	2,304	1,905	1,523	1,420	1,062	626	363	210	108	24	13
Cassette Single	258	230	299	299	275	236	189	134	94	48	5	-5	-2			
LP/EP	87	2	14	11	18	25	37	33	34	32	28	27	21	22	19	14
Vinyl Single	94	20	66	51	47	47	48	36	26	28	26	31	25	22	20	13
Music Video	172	8	157	213	231	220	236	324	508	377	282	329	288	400	607	602
DVD Audio									12			6	9	8	6	11
SACD														26	17	10
DVD Video*										66	80	191	236	370	561	540
<i>Total Physical</i>	<i>7,541</i>	<i>7,834</i>	<i>9,024</i>	<i>10,046</i>	<i>12,068</i>	<i>12,320</i>	<i>12,534</i>	<i>12,237</i>	<i>13,724</i>	<i>14,585</i>	<i>14,323</i>	<i>13,741</i>	<i>12,614</i>	<i>11,854</i>	<i>12,155</i>	<i>11,195</i>
<i>Total Physical to Retail Outlets</i>							10,768	10,786	12,165	13,048	12,705	12,389	11,549	11,053	11,423	10,478
<i>Digital</i>																
Digital Single															138	363
Digital Albums															46	136
Kiosk																1
Music Video																4
<i>Total Digital</i>															183	504
Mobile																422
Subscription																149
<i>Total Digital & Physical</i>	<i>7,541</i>	<i>7,834</i>	<i>9,024</i>	<i>10,046</i>	<i>12,068</i>	<i>12,320</i>	<i>12,534</i>	<i>12,237</i>	<i>13,724</i>	<i>14,585</i>	<i>14,323</i>	<i>13,741</i>	<i>12,614</i>	<i>11,854</i>	<i>12,338</i>	<i>12,270</i>

*Included in Music Video, but broken out for chart

36. The graphic below shows the peak in total dollar sales volumes across all media in 1999 followed by a general decline, with an increase in 2004 as digital music sales are included in the sales numbers.²³ The overall data show some volatility in sales volumes from year-to-year with current levels approximately similar to those in the mid-1990s.

²³ Including mobile phone downloads, record label digital sales total about \$1.1 billion globally, tripling in value from 2004. *IFPI:06, Digital Music Report*, International Federation of the Phonographic Industry, January 2006, p. 3.

RIAA Year End Statistics, Dollar Value by Format, 1990 to 2005



Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

37. While the preceding tables and charts show the cyclical trend in CDs and other media, as well as the increase in digital sales, they substantially understate the actual digital share of music works in 2004 and 2005.

2. Piracy

38. The understatement of digital volume in RIAA statistics is due to the exclusion of illegal (non-royalty bearing) downloads. For example, the IFPI estimates that almost 20 billion songs were illegally downloaded in 2005²⁴ as contrasted with the RIAA data above, which reports approximately 366.9 million singles and 13.6 million

²⁴

Piracy Report 2006, IFPI at p. 4.

albums downloaded via legitimate digital music services.²⁵ For the same time period, the RIAA reports total 2005 CD physical sales of 705.4 million.²⁶

39. Piracy ultimately affects the quantity of legitimate digital sales, creates cost pressure, and acts as a constraint on the ability to price digital music.²⁷ Piracy is ubiquitous, unconstrained by digital rights management (“DRM”) restrictions, increases customer turnover (or “churn”) for legitimate music providers, and makes it more difficult for digital music stores to keep attracting new customers.²⁸ Despite efforts by the record

²⁵ 2005 Year-End Statistics, RIAA, available at <http://RIAA.com/news/newsletter/pdf/2005yrEndStats.pdf>. This figure does not include subscription data.

²⁶ *Ibid.*

²⁷ In developing my testimony, I examined the wide variety of academic studies that have attempted to assess the effect of pirate file-sharing of digital music on physical sales of sound recordings and copyright value, and on other forms of legitimate sales including downloading. These studies provide useful background for the factors that market participants are attempting to address in development of market-based mechanisms for legitimate sale and pricing of music. While I have not independently studied the effect of piracy on sales of royalty-bearing works, the literature strongly supports the conclusion that piracy is a phenomenon that directly affects both copyright owners and companies attempting to market digital music to consumers. Academic literature addressing music piracy include Klein, Benjamin, V., Lerner, Andres and Murphy, Kevin M. (2002) “The Economics of Copyright “Fair Use” in a Networked World”, *The American Economic Review, Papers and Proceedings of the One Hundred Fourteenth Annual Meeting of the American Economic Association, Atlanta, GA, January 4-6, 92*, pp. 205-208; Rob, Rafael and Waldfogel, Joel. “Symposium: Piracy and File Sharing: Piracy on the High C’s: Music Downloading, Sales Displacement, and Social Welfare in a Sample of College Students.” (April 2006). 49 *The Journal of Law & Economics*; Zentner, Alejandro. “Symposium: Piracy and File Sharing: Measuring the Effect of File Sharing on Music Purchases.” (April 2006). 49 *The Journal of Law & Economics*; Bhattacharjee, Sudip, Gopal, Ram D., Lertwachara, Kaveepan, and Marsden, James R. “Symposium: Piracy and File Sharing: Impact of Legal Threats on Online Music Sharing Activity: An Analysis of Music Industry Legal Actions.” (April 2006). 49 *The Journal of Law & Economics*; Liebowitz, Stan J. “Symposium: Piracy and File Sharing: File Sharing: Creative Destruction or Just Plain Destruction?” (April 2006). 49 *The Journal of Law & Economics*; Halonen-Akatwijuka, Maija and Regner, Tobias. “Digital Technology and the Allocation of Ownership in the Music Industry.” CMPO, University of Bristol. January 2004; Smith, Michael D., Bailey, Joseph and Brynjolfsson, Erik, “Understanding Digital Markets: Review and Assessment”. Center for eBusiness@MIT. Paper 140, July 1999; Norbert J. Michel (2006) “The Impact of Digital File Sharing on the Music; Industry: An Empirical Analysis”, *Topics in Economic Analysis & Policy*: Vol. 6: No. 1, Article 18. <http://www.bepress.com/bejeap/topics/vol6/iss1/art18>

²⁸ Churn measures the amount of customer attrition and is typically calculated as the number of customers that discontinue the service divided by the total number of customers during

labels to prosecute piracy, illegal file-sharing remains a major challenge for legitimate providers of digital music services with new forms of on-line piracy emerging, all of which represent lost compensation to copyright owners and legitimate copyright users.²⁹

40. Moreover, illegal file-sharing constrains the price that legitimate digital music services can charge customers. One of the biggest challenges for legitimate digital music service providers is to convince consumers, particularly those in the high school and college age demographic group used to consuming music for free or from illegal file-sharing, to pay for music through legitimate services. Legitimate digital music service providers must distinguish their services via value-added content and ease of use. The price constraint imposed by illegal file-sharing on legitimate sales of digital music directly affects copyright owners in two ways. First, mechanical royalties are not collected on pirate copies of sound recordings, so this is income lost to copyright owners. Second, it constrains the copyright royalties that can be collected on legitimate downloads by constraining the price that legitimate copyright users can charge for digital music.³⁰

some specified period of time. Churn is a major cost item for digital music providers. I discuss this in greater detail later in this Report.

²⁹ The IFPI identifies three increasingly problematic forms of piracy. The first is LAN-based file-sharing, which involves users who are connected via a local area network, e.g., college campus, or a business. This form of illegal file-sharing has been a problem for business and in particular, college campuses because the illegal file-sharing consumes massive amounts of capacity on the firms/colleges network operations. An emerging form of piracy involves digital stream ripping. New technologies enable a user to capture a musical work stream and “rip it” to a saved digital file that can then be copied by others. The third form arises from the increasing use of mobile digital music services. Music pirates have discovered that Bluetooth capability available on most cellular handsets enables the unauthorized transfer of digital music files. IFPI Piracy Report 2006 at p. 5.

³⁰ Digital music services offer either or both permanent and limited downloads. The two are distinguished principally by conditions imposed on continued use of limited downloads, such as payment of a monthly subscription fee, whereas no additional payments are required for continued use of a permanent download. In other words, limited downloads convey a conditional right of ownership commensurate with the continuation of a subscription service in contrast to permanent downloads which convey a non-conditional right of ownership. As such, limited downloads are referred to interchangeably as conditional or tethered downloads in this Report.

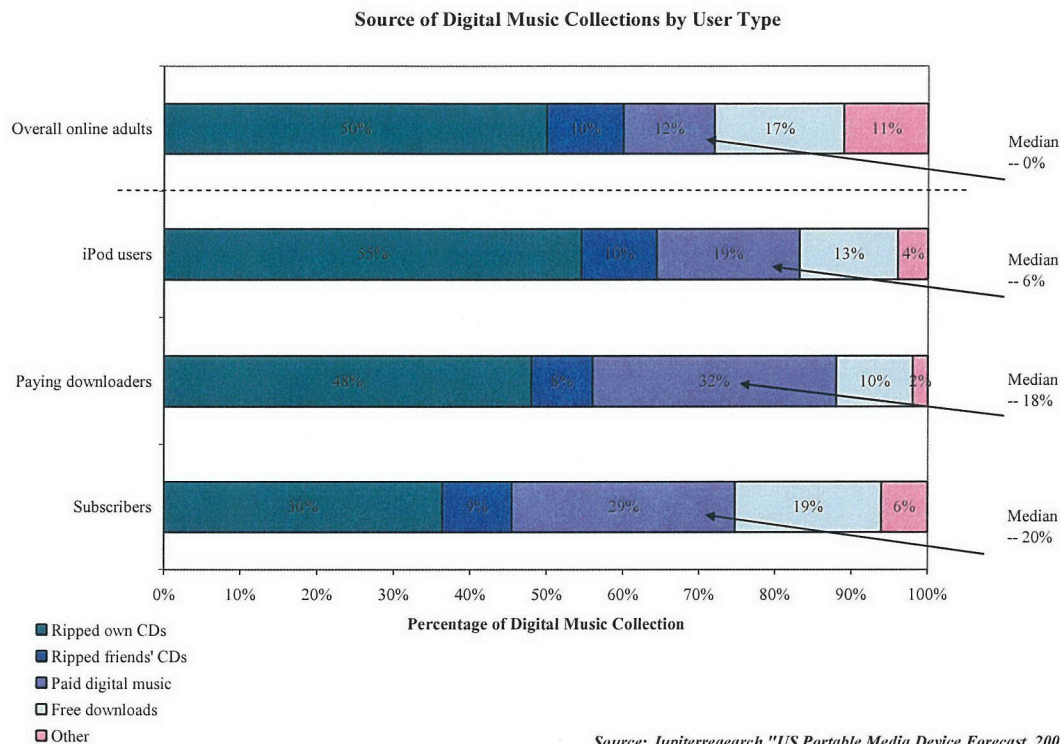
D. Digital Music Marketplace

1. Digital Music Trends and Developments

41. Digital music consumption is nascent. In many respects, both demand and supply are still evolving and the business models of today may not be the business models that ultimately emerge as the winning solutions to meet consumer demand. The following examines key patterns in consumer use of digital music and in the delivery of music via various business models and technologies.
42. *Consumer patterns*: Digital music can be delivered to consumers in a variety of ways depending on the consumer's preferences and sophistication in consuming music. Some consumers enjoy listening to a limited selection of music. Other consumers enjoy exploring a wide range of music. Some consumers may be inclined to own physical copies of music. These consumers value owning music that cannot be "reclaimed" and are willing to pay for this certainty. Other consumers value a wide variety of music and value the ability to access whatever music can be made available to them to explore and consume. Access rather than ownership is valued more highly. Some music consumers value portability and are willing to pay more for the ability to port music wherever they desire to consume it. Digital music has the ability to meet these varying desired attributes of consumers and to offer a variety of music services that meets the specific needs of consumers.
43. While there is no one pattern, the literature suggests that digital music consumers typically start with ripping music from their own physical CDs to a PC/Mac, and eventually to a portable digital music device.³¹ Consumers then frequently move to downloading tracks or bundled albums from digital music stores. Subscription services are yet a third means of consuming digital music. The following graphic provides some background context for the relative importance of these modes by type

³¹ Ripping is defined as converting a CD from its native CD-DA format to some other digital form, such as MP3 or AAC. In this context, ripping includes transferring the music contained on the physical CD to a PC/Mac and possibly, to a digital music device, such as an MP3 player.

of service chosen by the consumer. As the JupiterResearch chart shows, a greater proportion of subscription services users obtain their music collections from paid and free downloads than from ripping music from purchased physical CDs:



44. Downloading of music has been experienced by a substantial number of consumers. The percentage of Americans who have downloaded music from the Internet has continued to increase, reaching 26% in spring 2006.³² Approximately 14% of Americans downloaded digital music during the last 30 day period measured, increasing slightly above that achieved in 2005.³³ However, the average number of digital music files downloaded during the last month measured declined slightly to 11.5.³⁴ The percentage of Americans paying for downloaded digital music files also

³² *TEMPO: Keeping Pace with Digital Music Behavior—Quarter 1, 2006*, Ipsos Insight, p. 12.

³³ *Ibid.*, p. 12.

³⁴ *Ibid.*, p. 12.

increased in spring 2006, reaching a new high of 17% of the general population.³⁵ Almost two-thirds of downloaders paid for digital music in spring 2006 compared to 52% in December 2005.³⁶ Contributing to this increase in downloaded music may be the increased supply of portable digital music devices. The proportion of American teenagers with MP3 players increased from 28% to 54% in the spring 2006.³⁷ Approximately one-third of Americans age 18 to 34 have at least one portable digital music device.³⁸

2. Analysis of Digital Music Delivery and Business Models

45. Digital music business models may vary along several dimensions. The following are illustrative examples:

- First, digital music can be delivered in physical form (CDs) or digital form (downloads, tethered downloads, streaming, interactive and non-interactive radio).
- Second, music service providers can be “pure play” firms, i.e., providing streams and tethered downloads, or bundled media (music, videos, audiobooks, and/or games downloads).
- Third, firms may also be business-to-consumers (B2C), e.g., iTunes, Rhapsody, Napster, AOL/MusicNow, or business-to-business (B2B), e.g., MusicNet.
- Fourth, digital music can also be delivered on a per unit basis or via subscription service.

³⁵ *Ibid.*, p. 13.

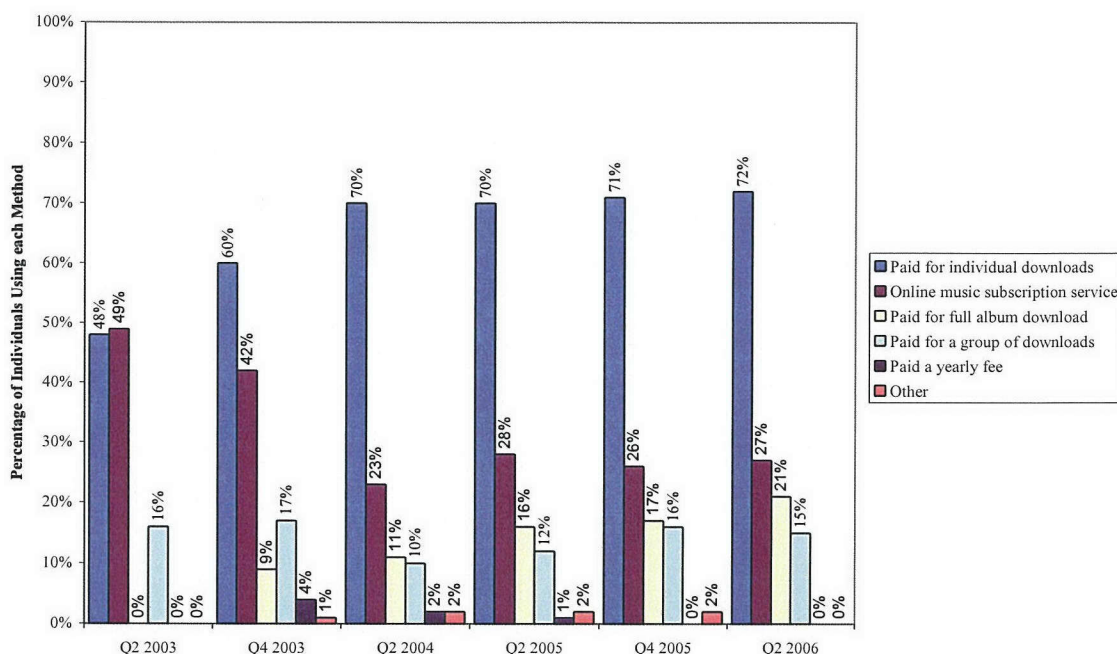
³⁶ *Ibid.*, p. 13.

³⁷ *Ibid.*, p. 14.

³⁸ *Ibid.*, p. 14. Additional tables and charts detailing major trends in consumer usage patterns are provided in the General Appendix.

46. The following provides a snapshot of trends in consumer usage of the various business models over the last several years, with the clear leader being downloads.

Methods of Fee-Based Digital Music Acquisition, 2003-2006



Source: TEMPO: Keeping Pace with Digital Music Behavior, Executive Summary, 2003-2006

47. The following table, based on data from the Washington Post, provides detail on six different firms in the digital music industry. The table highlights that the oldest firm (eMusic) entered in 1998, while the newest on the table was launched in May 2006. Some offer only downloads (e.g., iTunes), while others offer subscription services.³⁹

³⁹

The General Appendix contains more information on selected digital music providers' offerings and catalog size.

Digital Media Service Features

Source: "How to Get Your Digital Music Fix" *The Washington Post*

Service	File Format	Millions of Songs in Library	Subscription Fee	Download Fee	Launched
iTunes	AAC	> 3.5	n/a	99 cents per song	Apr-03
Rhapsody	WMA, RealAudio	> 2.7	\$14.99	99 cents per song	Dec-01
Napster	WMA	> 2	\$14.95	99 cents per song	Nov-03
Yahoo! Music	WMA	>2	\$9.99 - \$11.99	99 cents per song	Mar-05
Urge	WMA	>2	\$14.95	99 cents per song	May-06
eMusic	MP3	> 1.7	n/a	Starts at \$9.99 for 40 songs/month	Aug-98

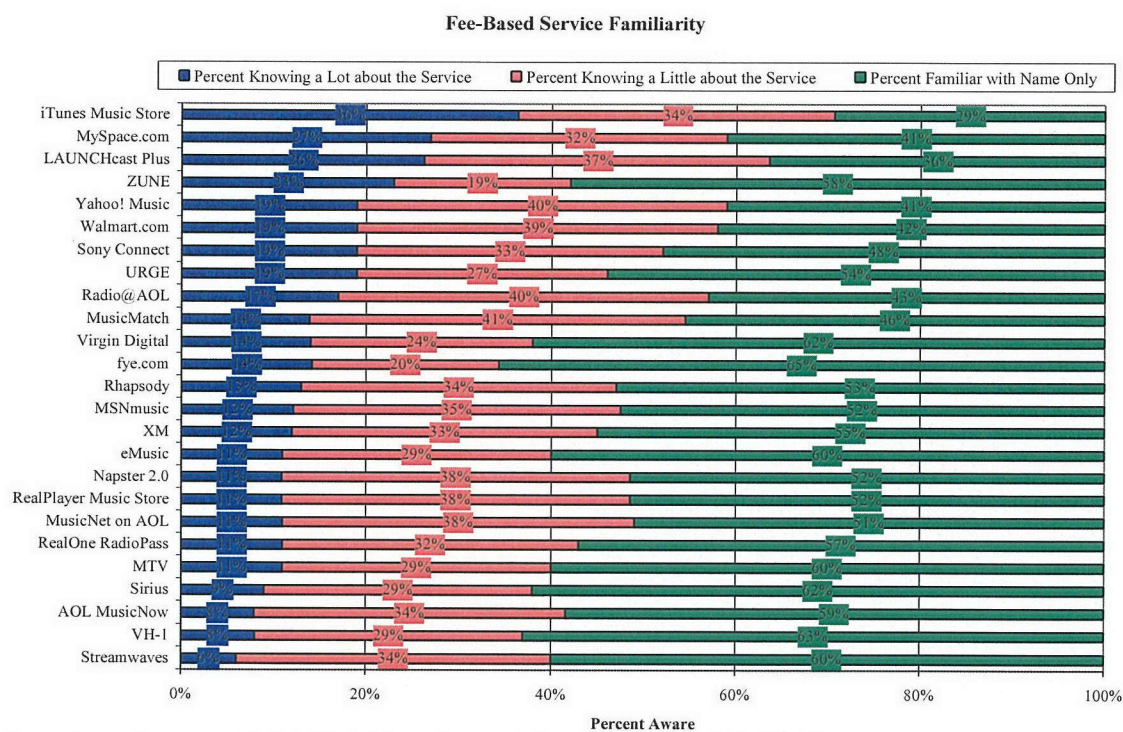
48. Behind this table of representative current participants in the digital industry, are a large number of failed or merged entities. By way of brief history: The MP3 format was introduced in 1994. Real Audio began operations in 1995, followed by Liquid Audio in 1997 and Diamond MN Rio in 1998. The on-line distribution of digital music began in 1998 with MP3.com and eMusic. Since then, many firms have entered, with some having then exited the market.⁴⁰

⁴⁰ The un-authorized file-sharing Napster began operations in 1999 and was shut down in 2001. This same year, Listen.com and the recording industry joint ventures *pressplay* and MusicNet began operations. Firms offering download services include eMusic, FullAudio, Liquid Audio, MP3.com, and Rioprot. eMusic and MP3 were acquired sometime before 2003. FullAudio was acquired by Circuit City and was later acquired by AOL. Firms offering streaming services have included Click Radio, iCast, Launch, Listen.com, MTVi, Musicbank MusicMatch, NetRadio, OnAir, and Streamwaves. All but Listen.com, Launch, MusicMatch, and Streamwaves declared bankruptcy and exited the market. Listen.com was acquired by RealNetworks in mid-2003. Several of these firms, including Launch and MyPlay, were later acquired by other firms. Yahoo acquired Launch in 2001 and Musicmatch in 2004. The un-authorized file-sharing sites, Napster and Scour.com were also acquired and transformed into legitimate digital music providers. DRM providers also have shared similar fate. Preview, Reciprocal, and Supertracks all declared bankruptcy and exited the marketplace. Intertrust remains a DRM supplier.

49. The volatility of this industry, particularly decisions to exit the marketplace and the reasons cited for these decisions, are relevant to the issues before the CRB. One of the most significant developments in this regard is the recently announced AOL/MusicNow's decision to exit the digital music services marketplace. AOL had entered the digital music marketplace in 2003 by offering the MusicNet back office subscription service, called MusicNet@AOL. It is my understanding that AOL chose to change its strategy in 2005, because there were an insufficient number of subscribers obtained. AOL acquired MusicNow (formerly Full Audio) in November 2005 which provided AOL with a full service digital music service, including permanent downloads. Despite considerable additional investments and a low original purchase price, MusicNow was never profitable. According to the testimony of Mr. Johnson, AOL believes it is necessary to have approximately 1.5 million subscribers profitably to support such a business, a customer level that AOL does not expect it can achieve. While AOL is a large, multimedia, internet savvy firm with strong marketing, promotion, and investment resources, the decision to exit highlights the difficulty in getting consumers to buy into the concept of legitimate digital music services where they have to pay to consumer digital music. From what I have seen, including AOL's information in the Confidential Appendix hereto, the cost structures underlying these business models are highly vulnerable to additional costs, and particularly to the number of users. Churn rates are high and continued investments in marketing, promotion, and content enhancements to attract and retain users are required. Revenue generation as well as revenue growth of successful businesses ultimately benefits both copyright owners as well as copyright users.
50. Record labels and digital music providers create and operate the distribution infrastructure that enables consumers to access a copyright owner's compositions. In addition, labels and digital music providers promote and market musical works. Digital music providers are indifferent to which musical works are purchased, only that musical works are downloaded or streamed by consumers. Continuing investment in marketing and promotion are imperative for these companies to create demand for their services and convince on-line consumers that these services provide value-added worth paying for since each track available on a digital provider's

website is available illegally for free elsewhere on the internet. These are costs borne by copyright users not by copyright owners, but one which benefits both parties.

51. Even for current providers, one of the difficulties confronting firms is name recognition as well as consumer awareness of the specific product offerings of the firm. The following shows that even among consumers that have heard of iTunes, only 36% of those consumers considered themselves to know “a lot” about the service.⁴¹



52. For illustrative purposes, the following examines in more detail three models of digital music provision.
53. Store models: Digital music stores are most like physical sales of CDs although there are particular attributes that distinguish consumer demand for on-line music

⁴¹

TEMPO: Keeping Pace with Digital Music Behavior—Quarter 1, 2006, Ipsos Insight

downloading from CDs. Apple's iTunes service was not the first legal digital music service to offer downloads, but Apple is acknowledged as having sparked an unprecedented interest in legal downloading. Downloading services typically offer the consumer the ability to download directly from the Internet to their PC or Mac a musical work for a set fee per track or per album. One of the most cited advantages of on-line downloading compared with physical product is the ability to download individual tracks rather than compiled albums.⁴² With digital music, consumers may sample tracks on a released album and choose to purchase individual tracks without having to purchase the bundled album. This advantage is now unique to digital downloading since record labels no longer offer singles. This attribute of digital downloading may be affecting physical CD sales as consumers choose the single track purchase model over the bundled physical CD model. Alternatively, statistics indicate that users will often sample songs on-line from an album and then decide to purchase the physical CD for their permanent music collection.^{43,44}

54. Digital music stores must continually invest in enhancing the digital music experience to entice the consumer to come back to the store, because tracks they offer are available for free on pirate P2P sites. Unlike traditional stores which may be able more readily to develop a steady clientele of repeat local visitors (e.g., "foot traffic"

⁴² Not all consumers view digital online downloading as a close substitute for physical CD sales. Some consumers prefer having a physical copy of a CD, believing it to be a safer, more assured source of ownership. The presence of DRM on permanent downloads is an impediment for some consumers who view DRM as limiting their use of music once purchased. Although consumers can burn a digital download to a CD, some consumers prefer the physical attributes of a jewel case, artwork, and other peripherals that come with a physical sale. Recently, iTunes has attempted to replicate some of these attributes by offering label art as part of the digital download. In addition, digital stores typically also offer other types of additional content to replicate or enhance the digital download experience.

⁴³ Analyses I have seen demonstrate that sampling has a positive effect on sales.

⁴⁴ "Online Music: At a new web store, many songs sell for a few cents," Wall Street Journal, October 14, 2006. In addition, MySpace announced plans to sell music on its site, allowing the artist or label to set the price. Amie Street, a new music web site carrying independent labels and little-known artists is setting the price for a download based on the number of times the song is downloaded. New tracks are free, but prices escalate up to a maximum price of 98 cents after around 130 downloads. Music on the site is provided by the artists, which take 70% of every sale after \$5.

in a mall), the digital music store cannot count on ready repeat customers to its particular site. Developing steady repeat customers is particularly important because moderate and heavy users – those that make use of a digital music “store” more than once a month – can represent a disproportionate share of revenues for digital music stores.⁴⁵ All customers must affirmatively choose to engage in individual transactions, and continued investment is necessary to reach individual customers and engage them in future transactions. Once a customer makes the initial decision to purchase a download, there is no guarantee of future revenue from that customer. Therefore, there is an ongoing need for promotional and content investment and innovation to entice buyers to become more frequent customers and also, to increase the size of their purchases. To continually attract these repeat buyers and increase the frequency of other buyers, iTunes provides numerous services to make the experience more appealing to consumers. For example, iTunes offers an extensive, easy-to-use tutorial that walks the consumer through numerous featured offerings.⁴⁶ In addition, iTunes offers a cataloguing tool that enables users to organize their music to fit their personal preferences, such as by genre, artist, date, and so on. iTunes also provides music exploration features to allow customers to search and explore music, encouraging users to expand their music consumption, and enhance their purchasing. The iTunes store also offers a broad array of products to its consumers, including movies, Podcasts, audiobooks, music videos, in addition to music. This business model enables Apple to draw a broader group of entertainment consumers to its website that may be attracted to consuming music, as well. These services are articulated in Mr. Cue’s witness statement on behalf of iTunes.

55. Subscription model: The subscription service business model is based on signing subscribers who pay a flat fee per month for the rights to conditional downloads and usually unlimited access to the service’s music catalog as long the subscriber continues to pay the monthly subscription fee. Subscription services also may offer tethered downloads to portable devices, where the subscriber is able to continue

⁴⁵ See Testimony of Mr. Eddy Cue of Apple.

⁴⁶ See <http://www.apple.com/ilife/tutorial/itunes/index.html>

accessing the work by reconnecting the portable device back to the originating PC periodically to confirm the user's subscription is valid.

56. For consumers that may otherwise purchase just a few CDs a year, annual subscriptions may actually expand the total purchase volume. Some industry analysts and consumers refer to subscription services as “renting” music because there is no permanent ownership of the music; although this depiction fails to capture the service dimension of the product offerings.
57. The conditional or tethered downloads offered by subscription services do not convey all the attributes of ownership to the consumer. This is considered by some consumers as a less valuable, more tenuous means of consuming digital music, and is viewed as justification for pricing conditional downloads at a lower price than permanent downloads. The subscription business model also bears greater legal uncertainty on the rights conveyed. This uncertainty leads to the potential for copyright stacking. Specifically, because services typically stream as well as offer conditional downloads, these services must obtain licenses from performing rights organizations (“PROs”), namely ASCAP, BMI, and SESAC, that represent the same ultimate copyright owners that receive payment under the Section 115 licenses in this proceeding. I understand that the PROs take the position that there is a separate public performance when a musical work is downloaded apart from when the musical work is streamed.⁴⁷ Since the digital music provider requires a public performance license for streaming and has no palatable alternative, such as arguing streaming is fair use or engaging in direct licensing, the PRO may be able to capture rents by either insisting on being paid separately for downloads or charging a much higher “hidden” bundled price for the required streaming license. This results in a form of copyright stacking, with additional costs being imposed on the licensees when conditional downloads are packaged with streaming to an end user.

⁴⁷ Joint Statement of American Society of Composers, Authors & Publishers (ASCAP), Broadcast Music, Inc. (BMI), The National Music Publishers' Association (NMPA), Harry Fox Agency (HFA) on Internet Uses of Music, November 2001. <http://www.ascap.com/legislation/jointstatement.html>.

58. While some industry observers have questioned whether making music available on a subscription basis reduces the amount of CDs or digital downloads purchased, the data I have reviewed demonstrate that subscription services tend to increase rather than decrease sales, which provide a direct benefit to copyright owners by increasing their fair return.
59. Subscription music, in general, has been a difficult concept to sell to consumers who can obtain any music they want for free on pirate sites. It requires the potential user to experience the service, the music exploration features, and the convenience they offer. This, by itself, is a substantial marketing challenge and one that is never-ending in that current churn rates require substantial efforts to continually acquire and retain new customers.
60. Subscription services not only must attract new subscribers, they must also convince these subscribers to remain consumers. Churn rates for subscription services remain high. One explanation for high churn rates is the scale of operations and nascent nature of these services. Churn rates typically are higher in the initial periods of operations. As these services build up a client base, churn rates typically decline. This explanation does not fully account for the churn rates found in this industry. Another contributor to churn includes credit card rejections. For example, credit cards can be cancelled or expire, which would result in the discontinuance of the subscriber account. Credit card churn can account for a substantial portion of overall churn during a 30-day period.
61. Music subscription services continually invest capital to increase the accessibility and ease of use for their services in order to retain subscribers. Investments are made to increase the editorial content offered by these services, the ability to search and discover unfamiliar music, and to make the consumer's experience more attractive. In addition, subscription services offer free trial subscriptions for limited periods of time that may or may not result in the subscriber signing on for paid services at the end of trial. Reducing churn rates is a key objective of digital music providers.

62. Several digital music providers also offer permanent download sales and subscription services. RealNetworks, for example, offers the Real Music Store and the Rhapsody subscription services. MusicNet offers permanent download services to its partners. Napster offers its Napster Light download store where 2.5 million tracks can be downloaded.
63. White label business model: MusicNet is unique among digital music service providers in that it is a “white label,” i.e., digital music content aggregator, offering business-to-business digital music delivery services that its customers then sell to the consumer. MusicNet provides digital music streaming, downloading, and burning services over the internet to customers such as Yahoo!, Virgin, MTV Networks, and others, which offer the “face” of the music service to consumers. MusicNet provides some or all of the backroom services required to offer digital music over the internet, including obtaining and encoding content; DRM design, implementation and management; bandwidth/hosting services; clearance and securing of rights; reporting and payment of label and publishing royalties; programming content; subscriber management; partner/distributor integration; and development support and software. MusicNet also offers e-commerce and customer service if requested by its distributor partners. The ability of MusicNet to provide these same services and content to multiple partners over a larger number of total subscribers benefits both MusicNet and its partners in terms of scale economies. MusicNet’s partners are able to provide these name brand services at a lower cost and with shorter start-up time than they could do themselves. Under this type of business model, the consumer benefits from a wider range of purchasing and subscription options and copyright owners benefit by having their musical works available through a larger selection of vendors, which results in a wider availability of creative works in the marketplace. MusicNet does not provide marketing services or support for its partners.
64. New business models: Business models will continue to evolve and new ones may develop as digital music providers seek out alternative ways of inducing consumers to purchase more digital music, given the price constraints and cost structures facing these providers. The volatility of firms competing in this industry suggests that the

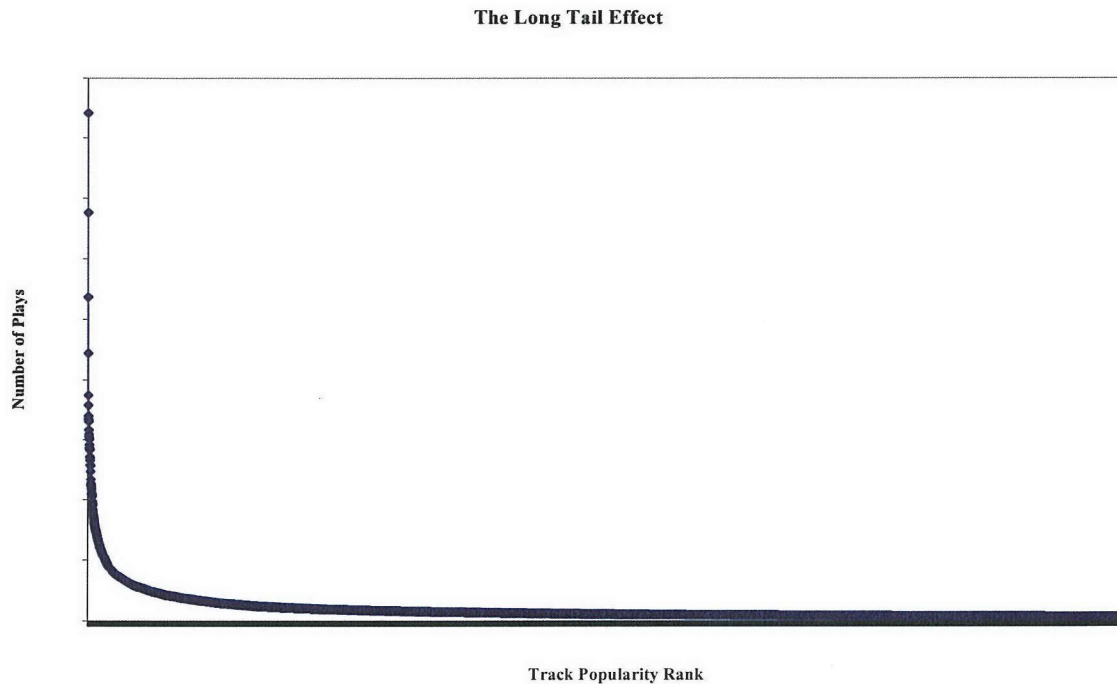
players and business models today may not necessarily be those that exist in the near future. A compulsory rate set today must be flexible enough to accommodate this evolution.

3. Scope and Diversity of Music Offerings

65. My review of data and discussions with several digital music service provider executives show a significant increase in the availability of musical works accessible at any point in time by consumers of on-line digital music services. As shown in the table below, anywhere from 2 to over 3 million songs are accessible on-line from legal digital music sites to consumers. This extraordinary catalog of music compares to a typical “bricks and mortar” music store which may offer 4,500 CD albums and virtually no single tracks for consumers.⁴⁸ In addition, a much narrower selection of artists may be offered at a typical music store, usually the top selling albums or standard classics. Traditional retail music stores, such as the now-liquidated Tower Records, have suffered from increased competition by piracy, and from non-traditional music stores, such as mass merchandisers and bookstores, which are less likely to offer the depth and breadth of musical works of traditional music stores. In comparison, digital music stores offer an increasing unparalleled selection of independent music as well as other less popular genres. Digital music providers have created, at great expense, websites that enable the music consumer to explore unknown or more obscure musical works across a broad array of different music genres. This ease of use enhances the consumer’s ability to think “outside the box” in consuming new and older music.
66. I have reviewed data for specific digital music service providers and they show that diversity is reflected both in number of works and in genres covered and consumed. While typically top selling tracks and albums are analogous on-line and offline, digital music companies allow users to select from and consume a far wider and deeper catalog of musical works, exposing many more songs to the paying public,

⁴⁸ Wal*Mart, the largest music retailer in the United States, carries about 4,500 unique CD titles. *The Long Tail*, Chris Anderson, Hyperion, New York, 2006. p. 20.

and benefiting copyright owners greatly. This long tail effect is represented by the graphic below.



67. On-line digital catalogs doubled from 2004 to 2005 with at least 2 million tracks and 165,000 albums now available on the major services.⁴⁹ Digital-only labels are being established by the record labels—Universal’s UMe digital was established in November 2004 and Warner Music’s Cordless Recordings in November 2005.⁵⁰
68. Catalogs are not just large in size, but also are used or accessed to a considerable extent -- a substantial proportion of a subscription service’s catalog can be accessed within a 12 month period, with large number of individual works accessed each month.

⁴⁹ *IFPI:06, Digital Music Report*, International Federation of the Phonographic Industry, January 2006, p. 4

⁵⁰ *Ibid.*, p. 9.

69. An additional measure of the difference in range of works covered is shown in the following table, which compares digital versus album sales. The table shows that “older” catalog sales account for a larger proportion of total digital albums relative to older catalog sales of physical CDs.

Comparison of Age of CDs vs. Digital Album Sales, 2005-2006

		Album Sales (millions)							
		CD Albums				Digital Albums			
		YTD 2006	%	YTD 2005	%	YTD 2006	%	YTD 2005	%
Current		252	48.8%	277	50.2%	15	44.1%	7	43.8%
Catalog (>18 months)		155	30.0%	164	29.7%	11	32.4%	5	31.3%
Deep Catalog (>36 months)		109	21.1%	111	20.1%	8	23.5%	4	25.0%
Total		516	100.0%	552	100.0%	34	100.0%	16	100.0%

Source: Nielsen Soundscan

70. Another measure of the diversity of music consumption is the various music media used by consumers to obtain their music libraries. Although Americans continue to maintain the majority of their music collections in physical form (84%), the proportion of digitally-maintained musical works has almost doubled since fall 2005, reaching 16% in spring 2006 compared with 9% in September 2005.⁵¹ Teens have surpassed 18-24 year olds in the proportion of music maintained digitally, 41% compared with 34%.⁵² The primary source of digitally-maintained music continues to be music files ripped from physical CDs (47%).⁵³ Jupiter Research predicts digital music will replace lost CD sales and restore growth--\$12.8 billion total market 2004

⁵¹ *TEMPO: Keeping Pace with Digital Music Behavior—Quarter 1, 2006*, Ipsos-Insight, p. 15.

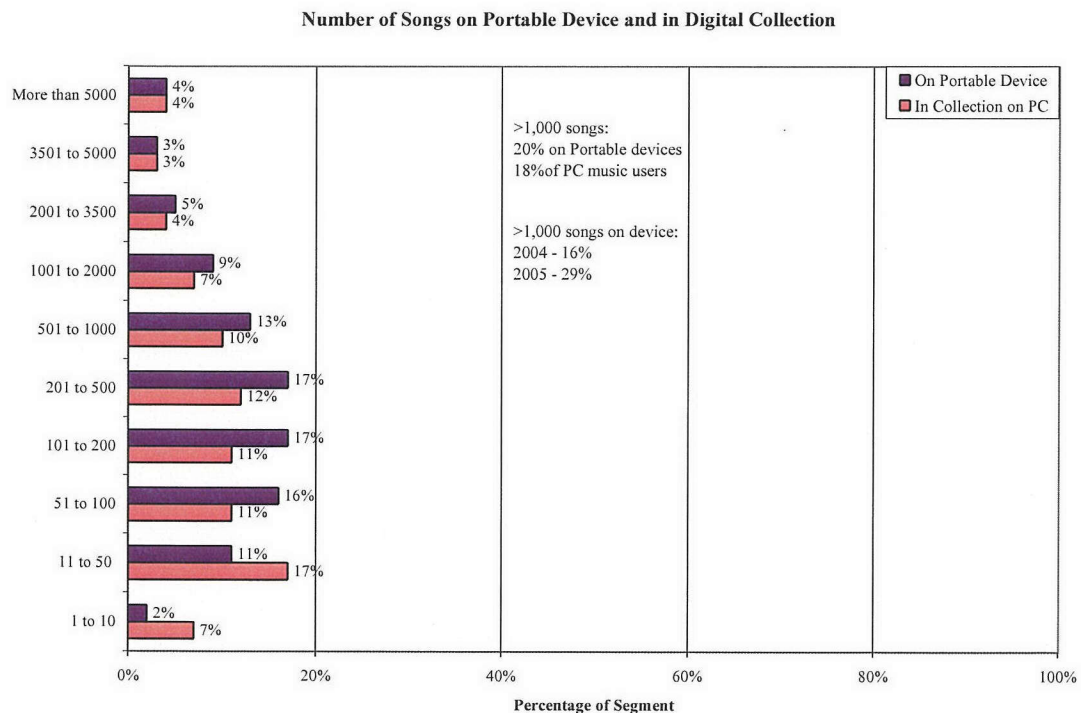
⁵² *Ibid.*, p. 15.

⁵³ *Ibid.*, p. 15.

compared with projected \$15 billion total market in 2010. Category spending is also predicted to shift as shown in the table below:⁵⁴

<i>Category</i>	<i>2004</i>	<i>2010</i>
<i>Off line physical</i>	89%	70%
<i>On-line physical</i>	7%	9%
<i>Digital</i>	2%	15%
<i>Ringtones</i>	2%	6%

71. The following provides Jupiter Research's estimates of the number of songs maintained on portable devices and PCs based on survey results. These data show that the number of songs contained on portable digital devices has increased significantly from 2004 to 2005. Growth in portable digital music devices and number of songs maintained on these devices should correspond to greater digital music sales.



Source: Jupiterresearch "US Portable Music Device Forecast, 2006 to 2011"

4. Investments and Promotions

72. Digital music service providers must expend considerable capital for startup to launch a digital music service, and once established, additional capital is continually invested to enhance and update these services. Mr. Eddy Cue testifies that Apple has invested millions of dollars in developing a music store that provides consumers with easy access to over 3 million tracks. This investment conveys royalties to copyright owners whenever a track is downloaded by a user. This invested capital has supported the development and implementation of hardware and software needed to operate both back office and customer interfaces. Significant capital is invested in hardware and software engineering required to make the music store secure and reliable. For example, as a digital retailer, Apple must invest in software to prevent on-line fraud and identity theft. In addition, Apple continues to make substantial investments to enhance the accessibility and value of this music experience to consumers.
73. Mr. Alan McGlade of MusicNet testifies that MusicNet invested substantial monies in the platform required to deliver digital music services to its distributor partners. MusicNet provided detailed information on the capital costs it has incurred to make its digital music services available to customers.
74. According to the testimony of Ms. Laura Goldberg, Napster has spent substantial amounts of capital to build and enhance the infrastructure supporting Napster's subscription services. Napster has yet to see a positive return on this investment and has put the business on the market for potential sale.
75. The testimony of Mr. Kyle Johnson of AOL describes the considerable investment made by AOL/MusicNow and its predecessor, Full Audio, in creating a digital music service. MusicNow raised substantial investment venture capital between 2001 and 2003 to develop the necessary infrastructure to support millions of subscribers and offer concurrent musical works to customers. Investments have continued to support, upgrade, and market these services without having returned any profits back to the company.

76. The testimony of Mr. Tim Quirk of RealNetworks describes the financial and human capital investments made by RealNetworks to offer their Rhapsody music subscription services. These investments are ongoing in the areas of R&D, marketing, licensing, bandwidth, and general overhead. As Mr. Quirk testifies, the delivery of digital music includes subscription management costs, which are unique to digital music, and IT, DRM, and marketing costs, which are substantial. In addition, content costs are a substantial portion of costs for these businesses.
77. I also have examined illustrative information on digital music service providers' promotional efforts and conclude that firms have made major contributions in promotion at great expense. In addition, these firms' efforts have increased the diversity of musical works available and easily accessible to consumers, which has led to an increase in the relative demand for a wider diversity of musical works. This increased diversity greatly benefits a wider array of copyright owners by "flattening out" the income curve predicted by the Superstar theory, as discussed herein.
78. Napster has its own recording studio where it records new music to release to subscribers as part of its promotional efforts. iTunes offers a promotional "Single of the Week" whereby consumers can download the promoted tracks for free. Statistics have shown that paid downloads of tracks from artists featured as part of the Single of the Week promotion increased substantially following the free promotion. Other types of successful promotional efforts include Rhapsody 25 and Napster.com, which offer consumers free access to their catalog for a limited number of uses. Rhapsody 25 allows 25 free "listens" per month while Napster.com limits the number of times a consumer may listen to a particular track. Another successful promotional scheme is gift cards, which are offered by most of the digital music service providers. Gift cards are available on the music service website and at major retailers, such as Circuit City, Best Buy, Radio Shack, and others.
79. These promotional efforts are expensive but have proven to be an important mechanism for digital music providers to market their services, particularly in competition with free illegal file-sharing. Increasing the volume of musical works

downloaded or offered through these services is imperative for the financial sustainability of these undertakings, with direct benefits to copyright owners from these efforts.

80. I reviewed the financial data provided by several digital music service providers and conducted one-on-one interviews with firm executives on their investments in developing digital music. From this research, I learned that investments in marketing and promoting digital music services are one of the most significant operating costs incurred by these firms and one that is critical to sustaining and growing the businesses.
81. These investments differ by business model. For example, AOL/MusicNow, RealNetworks, and iTunes are part of more diversified businesses. AOL is a large multimedia internet operation and Apple operates its Mac computer business and also its related, highly successful iPOD business. RealNetworks offers a wide variety of internet services in addition to music downloading and subscription services. These digital music service providers have the ability to promote their digital music service businesses through their sister operations in addition to the promotional efforts, such as music exploration and editorial value-added content on the music offered. Incremental promotion and marketing through these sister operations attract users to digital music services. As I discussed earlier, iTunes also offers other products, such as movies and audiobooks, to attract a broader array of entertainment consumers.
82. For its part, Napster must bear the cost of promoting and marketing its services from its returns to digital music sales. Napster is partnering with other firms to offer its subscription services, such as through mobile cell phones.⁵⁵ Napster offers a wide variety of services that might appeal to different consumers, including its recent addition Napster.com, which is among the only legal, advertising-supported digital music service offering free, on-demand listening to any track in its catalog up to three times.

⁵⁵ “Cingular to Launch Cellphone Music Service,” The Wall Street Journal, November 1, 2006.

5. Costs and Financials

83. The cost structure of digital music is no less challenging, and perhaps, even more challenging than that of physical distribution of digital music. I have reviewed income statements for several digital music service providers, which detail cost categories as well as revenues. These summaries indicate that a large portion of digital music stores and subscription services' revenues are consumed by royalty payments. On average, these payments represent a very substantial percentage of revenues. In addition, there are other costs of goods sold, or variable costs, which include direct customer support, bandwidth/hosting costs and credit card fees.
84. Operating expenses are significant. These costs include the cost of ingestion, technology design and development, and other expenses required to make the product available to the consumer. Another key component cost is marketing. In my interviews with digital music provider executives, marketing was identified as a critical investment needed to stimulate the necessary usage required to grow the business and hence, achieve critical levels of revenue to be sustainable in the long run. All executives indicated that they expected marketing costs to increase substantially over the coming years. This is a necessary investment required to expand the availability and accessibility of digital music that is incurred by the copyright users, but which directly benefits the copyright owner as well.
85. Administration of royalty payments for mechanical rights may differ for permanent and conditional downloads, and thus directly affect the cost structure of subscription services compared with digital music stores. It is my understanding that the record labels take responsibility for administering the payment of mechanical royalties to the publisher/copyright owner for permanent downloads. However, the record labels may or may not administer the mechanical royalties for conditional downloads, which could shift this administrative burden to some subscription services (who in turn must identify the copyright owner/publisher and arrange payment for this portion of their business). This would result in higher administrative costs for some subscription services in offering conditional downloads.

86. Several industry observers have attempted to breakdown the costs of providing digital music services compared with physical CDs. These estimates are presented in the following table. While these estimates are informative as a source of publicly available information, my analysis and conclusions rely primarily on actual revenue and cost data provided by industry participants. These estimates indicate that digital music service providers face considerable financial challenges.

Relative Cost of Producing Digital Music

	Jupiter Research Estimates (1)		
	<u>CDs</u>	<u>Downloads</u>	<u>Subscription</u>
Consumer spend	\$14.00	\$0.99	\$10/month
Distribution/payment	11%	30%	2%
Marketing	7%	3%	50%
Manufacturing	11%	4%	2%
Rights Holders	30%	65%	55%
Retailer	20%	-2%	-9%

	Almighty Institute of Music Retail (2)	
	<u>\$ CD value</u>	<u>% of Retail</u>
Consumer Spend	\$15.99	100%
Musicians' Union	\$0.17	1%
Packaging/Manufacturing	\$0.80	5%
Publishing Royalties	\$0.82	5%
Distribution	\$0.90	6%
Artists' Royalties	\$1.60	10%
Marketing/Promotion	\$2.40	15%
Label Overhead	\$2.91	18%
Retail Overhead	\$3.89	24%
Label Profit	\$1.70	11%
Retail Profit	\$0.80	5%

Source:

(1) Jupiter Research, US Music Forecast, 2005-2010, p. 11.

(2) "Wal-Mart Wants \$10 CDs", www.rollingstone.com/news

6. Summary of Factors Affecting Future Growth and Profitability

87. Industry analysts have identified key factors affecting growth of digital music distribution. Jupiter Research conducted a study of executives, which rated factors

having a positive impact on digital music services during the next 12 months.⁵⁶ The factors identified were:

- Growth in broadband adoption
- Strong sales of MP3 players
- Continued success of existing services
- Portable subscription services
- Success of traditional retailers' digital stores
- Promotion of broadband ISPs

88. Similarly, factors have been identified that are likely to adversely affect the growth of digital music distribution.⁵⁷ These factors include:

- Internet piracy and the need for more effective cooperation from ISPs
- Interoperability between formats and devices or development of new technologies
- Emerging threat of unlicensed digital stream ripping from digital radio and internet webcasts.

89. I have interviewed executives of several major digital music service providers about these issues, and they identified that the need to educate consumers about the value-added proposition of legitimate consumption of digital music as a major challenge. With non-royalty bearing music available through illegal file-sharing, consumers must determine that there is value in paying to consume music through legitimate providers. That value-added is most often encapsulated in ease of use, time savings, music discovery, and additional content.

⁵⁶ *European Digital Music Value Chain: Making the Most of Small Margins and High Costs*, Jupiter Research, 2006, p. 8. Although these factors were identified based on analysis of the European markets, I find support in my study of the U.S. marketplace for the importance of these factors in the growth of U.S. digital music sales.

⁵⁷ *IFPI:06, Digital Music Report*, International Federation of the Phonographic Industry, January 2006, p. 16.

90. A large body of evidence indicates that digital sales may stimulate the demand for music, including physical media sales. The majority of fee-based downloaders have purchased an artist's pre-recorded CD after having first paid to download at least one song from the album.⁵⁸ Americans are supplementing traditional methods of consuming music with digital, which offers increased flexibility and ease of use.⁵⁹
91. Music portability is viewed as an advantage by consumers. To protect various copyrights, content suppliers, specifically record labels and other copyright owners, have insisted on DRM restrictions to prevent non-royalty bearing uses of their musical works. Digital music providers have responded by choosing different DRM technologies "wrapped" around this content. In some cases, these technologies are incompatible and create interoperability issues for consumers. Consumers typically want to be able to consume music however they wish once it is purchased, particularly port their music among devices, and find these interoperability constraints a source of frustration. There are a wide variety of potential industry responses that are developing with regard to portability, including partnerships and ventures to offer dedicated devices for portability.
92. With the introduction of such services as Rhapsody To Go and Napster-To-Go, and compatible portable digital music devices, subscription services will likely get further traction in the marketplace. The number of songs on portable devices is significant but not yet taxing the capacity of portable devices. One survey indicated that only 18% of on-line adults have more than 1,000 songs on their portable music device.⁶⁰ Sales of portable devices are projected to increase from 26.0 million in 2005 to 29.8 million in 2011.⁶¹ The General Appendix provides information on available portable media devices and the DRM technology used.

⁵⁸ *TEMPO: Keeping Pace with Digital Music Behavior—Quarter 1, 2005*, Ipsos-Insight, p. 12.

⁵⁹ *Ibid.*, p. 12.

⁶⁰ *US Portable Music Device Forecast, 2006 to 2011*, Jupiter Research, p. 2.

⁶¹ *Ibid.*, p.3.

93. The popularity of the iPod has been a major factor behind a significant increase in download sales. Downloading music using iTunes enables the consumer to play it on their PC or Mac, or port music to their iPod or other authorized players. There also has been the introduction of additional partnerships — for example, RealNetworks’ Sansa and Microsoft’s Zune, and the expected greater use of mobile phone devices.⁶² Zune is the newly introduced portable digital media device that Microsoft will operate in conjunction with its Zune Marketplace digital music service. RealNetworks has partnered with Sandisk and Best Buy to offer a new digital player, the Sansa e200R Rhapsody MP3. As such, there are potential competing networks of users with specific technologies; a key issue for the industry is the extent to which sufficient consumers will be dedicated to particular technologies or inclined to have multiple technologies.
94. Most industry analysts recognize the huge potential of cellular phones as a means of music distribution.⁶³ For example, mobile music applications account for at least 90 percent of Japan’s digital music market.⁶⁴ Jupiter Research projects music cell phones will exceed MP3 players in 2009, increasing from 5.1 million in 2005 to 76.9 million in 2009, and then to 140.9 million in 2011. These devices typically have a two-year product life cycle.⁶⁵
95. Predicting the future of such a nascent market is difficult. The U.S. and Europe may not fully follow the Japanese experience. According to Jaap Favier, VP at Forrester Research in Amsterdam, Europeans still prefer to download music to their PCs and then “sideload” tracks to their mobile cell phones. Forrester Research predicts mobile cellphone downloads will account for only about 20% of digital full-track music sales

⁶² *Ibid.*, p. 4.

⁶³ For example, see *U.S. Wireless Music 2006-2010 Forecast and Analysis*, IDC, May 2005, IDC #201748, Volume:1; and *U.S. Music Forecast, 2005-2010*, JupiterResearch, MUS05-V02, 2005.

⁶⁴ “Big Music Takes on Steve Jobs,” September 4, 2006 issue, <http://www.redherring.com>, accessed October 23, 2006.

⁶⁵ *US Portable Music Device Forecast, 2006 to 2011*, Jupiter Research, p. 4.

by 2011.⁶⁶ In addition, it cites the biggest impediment to be cost structure—slices of the pie. Record labels have set the wholesale price significantly above computer-based download services (\$1-\$1.40 per song versus \$0.65-\$0.75 per song) and application services providers that provide the downloading platforms for the carrier stores also are taking a considerable chunk of the pie, which may impede further growth in this market.⁶⁷

96. All of these developments highlight the fact that market participants are making technology-specific investments as the near-to-medium term mechanism to support portability and expand the scope of digital offerings, which in turn creates some increased financial risks and volatility in the marketplace.

III. Analysis and recommendation of copyright royalty rate

A. Overview of Approach: Key Economic Principles

97. In addressing the issue of a proposed rate methodology and structure, I have reviewed carefully the elements of the Section 801(b)(1) standards, which explicitly consider the benefits to society of maximizing creative works while also recognizing that copyright owners and users must be allowed the opportunity to achieve fair compensation for their efforts.⁶⁸ These objectives are distinct from other rate setting objectives that attempt to replicate a market price based on the economic concept of c

⁶⁶ “Big Music Takes on Steve Jobs,” September 4, 2006 issue, <http://www.redherring.com>, accessed October 23, 2006.

⁶⁷ *Ibid.*

⁶⁸ Technology has brought new challenges to the copyright owner versus user debate. The CBO, for example has identified four key reasons making revisions to copyright laws more difficult: (1) rapid advance of digital technology creates new conflicts between copyright owners and users regarding legally acquired creative works in digital form, (2) technological progress poses unprecedented obstacles to copyright enforcement, (3) technological advances affect much wider variety of creative works, increasing enforcement demands and (4) advances in digital technology affect many sectors of the economy beyond those directly related to copyrights. *Copyright Issues in Digital Media*, August 2004, Congressional Budget Office, p. 1.

willingness to pay. Imbedded in the principles of 801(b) (1) is recognition of the interplay among the sides of the market in achieving the specific goals.

98. In developing recommendations for rate structure and methodology, I also took into consideration the facts and conditions of the industry in the context of the four objectives, and set out the economic principles of a rate methodology that would satisfy the four objectives. The following summarizes the key elements of the economics of the digital music industry relevant to the development of a proposed rate structure and methodology:
99. *The digital music format and digital music services have the potential to provide very large catalogs of works to consumers with diverse music tastes and preferences.* In particular, the digital format provides a mechanism to overcome the “Superstar” phenomenon.⁶⁹ Physical media exemplifies this phenomenon, due to the tendency to stock only the most popular songs given the incentive to make available the products that are most likely to be demanded by customers. In practical terms, digital media is subject to the “long tail” phenomenon,⁷⁰ which is the ability at lower incremental cost to deliver large and diverse set of music content to customers.

⁶⁹ “The Economics of Superstars,” Sherwin Rosen, *The American Economic Review*, Vol. 71, No. 5. (Dec., 1981), pp. 845-858. Rosen observed that a relatively small number of authors, comedians, and artists accounted for a large fraction of the overall rewards, or compensation, from those activities. Rosen found that this phenomenon is caused by two factors—a hierarchy of talent and the perfect, or near perfect, reproducibility of art. For example, a relatively small number of full-time classical music soloists accounted for a large portion of the overall income generated by these artists. In addition, he observed substantial differences in income between these artists and those considered to be second rank even though consumers might not be able to detect a soloist’s performance from a classical second rank performer. Rosen identified two common elements across professions exhibiting this behavior: (1) a close relationship between personal reward and one’s own market, and (2) a strong tendency for both rewards and market size to be skewed towards the most talented people engaged in the activity. Rosen found that small differences in talent become magnified in larger income differences, and increases even more dramatically at the top of the income to talent scale. Differences in success, as measured by income, are much greater than differences in talent.

⁷⁰ Anderson finds that there is significant money to be made by focusing on providing the so-called long tail in which the combined value of more modest sales of more products can equal or exceed the value of top sellers individually. *The Long Tail*, Chris Anderson, Hyperion, New York, 2006.

100. The economic implication of these phenomena applied to the digital context is the ability to increase the potential income of those other than the most successful and presumed talented content providers by providing increased accessibility to lesser known musical works or a broader range of a copyright owner's music catalog. This advantage is borne out by the long tail effect that arises in digital music consumption. I conducted an independent review of these phenomena by examining industry literature and empirical analyses of data from various digital media providers. From what I have seen, data on sales from various digital music providers confirm that the distribution of sales of physical CDs is different from that of digital media, with substantially greater sales volumes of lesser known digital works. For example, Soundscan estimates that less than 18% of digital music tracks purchased over the internet are top 200 tracks, while about 82% of digital tracks are part of the long tail phenomena, less frequently purchased tracks that account in sum for a greater proportion of overall sales. This is consistent with data in the appendices on catalogs, which show the distribution of works across genres, and frequency of plays. These statistics indicate that on-line digital music distribution benefits a larger number of copyright owners than physical CD sales because of lower prices and access to much larger inventories of musical works.⁷¹

101. It is also borne out by some survey research. In 2004, the Pew Internet & American Life Project conducted a survey of artists and musicians to determine their views on internet music distribution.⁷² The survey found that artists and musicians view the internet as a tool that enhances their ability to make, market, and sell their creative works. Most agree that peer-to-peer file-sharing should be illegal, but do not see on-

⁷¹ Content providers are changing their business models to take advantage of these potential income flows. For example, Universal Music undertook to examine directly the long tail theory and found that low sales of releases can collectively create a huge market. "We are now able to respond to and quantify the appetite for more eclectic, diverse recordings from the past....It's clear that this is a "tail" worth chasing," said Olivier Robert-Murphy, VP of Strategic Marketing at Universal Music's international arm "Universal Music finds 'long tail' for old albums," c/net News.com, <http://news.com>, October 17, 2006, accessed October 23, 2006.

⁷² *Artists, Musicians and the Internet*, Pew Internet & American Life Project, December 5, 2004.

line file-sharing as a threat to their creative industries. These artists and musicians are more likely to view the internet as making it possible to earn more money from their creative works than as having a negative impact due to piracy and unlawful use.⁷³ Most view the internet as having helped them create and distribute their work with only a few experiencing negative impacts from the internet on their careers.⁷⁴

102. The existence of piracy and the wide availability of unauthorized digital music content implies that there will be substantial potential leakage of sales from digital (and other media such as CDs), the avoidance or reduction of which will require the development of value added services, sophisticated market-based mechanisms for efficient transactions, cost pressures, and substantial downward pressure on the prices that can be charged for music relative to a world in which these factors are not present.

103. The presence of large and diverse customer base with diverse preferences means that the industry will have the incentive to develop and attempt to sustain a range of business models for meeting customer demand. There is no "one size fits all" technology that is immediately apparent as the long run technology of choice.

Moreover, the industry has developed with simultaneous and competing business models, some of which have had greater immediate business success due to their closeness in product space to non-digital technologies. The development and expansion of business models such as iTunes have had substantial spillover benefits for the industry as a whole by increasing the interest and demand for digital music services. At the same time, developing profitable competing technologies based on different business models, which may or may not be preferred longer term solutions, is challenged by the need to educate consumers concerning new modes and to develop complementary technologies and devices. Finally, while the concurrent presence of different business models provides greater diversity for consumers and a variety of outlets for copyright holders, it also means that the industry continues in a

⁷³ *Ibid.*, p. ii.

⁷⁴ *Ibid.*, p. 13.

development phase with potentially higher costs, continued pressure on prices, possibly continued periods of smaller consumer bases for many firms, and the risk of failure or lack of profitability depending on the evolution of technologies and consumer preferences.

104. *While the incremental costs of delivering music content are low, thereby facilitating the delivery of very large catalogs of works to large numbers of consumers, developing, marketing, and sustaining operations in the digital music industry requires high fixed costs for marketing and development, including own or joint investments in complementary technologies (such as for portability).* Digital media firms must simultaneously expand customer bases to achieve economies of scale and scope, while expanding the universe of works and services available to serve the customer base. The ability to set pricing of services at levels that are attractive to new customers is challenged by the need to earn sufficient returns to cover the infrastructure and marketing investments. In turn, this has led to the relative expansion of firms with complementary services or operations that provide opportunities for shared or common costs or marketing. Copyright owners benefit significantly from all these investments.
105. *Payments to copyright holders for sound recordings already constitute a large proportion of operating costs for digital media firms.*⁷⁵
106. *The presence of sampling and free downloads mean that consumers are provided incentives and opportunities to gain access and test out a broader and diverse array of music.* This has the potential benefit of expanding greatly the exposure of a more diverse set of artists to a broader array of consumers. At the same time, there are two implications for the profitability of digital media firms: (1) if the sampling or testing of music results in ultimate purchase of the music, the purchase may be made at a business other than the one providing the sampling or value-added service. As such, the increased sales revenues and profits would not accrue to the firm that engages in

⁷⁵ Royalty payments for sound recordings, publishing, and other rights are generally lumped together in company financials. Sound recording royalties paid to the record labels account for the substantial portion of these royalties.

the service. This could limit their incentive and ability to provide the service. And (2) encouraging sampling and testing in order to increase consumer acceptance of digital music and to increase the overall digital pie may require lower or less visible pricing of the “bundled” service – in turn this implies that a per unit royalty cost structure could prove very costly and unprofitable for firms.

107. The foregoing factors imply an industry in which firms are at different stages of development and profitability, and where product pricing is still in introductory stages.

B. Basis for Recommendation for Rate Structure

108. I took these economic fundamentals into consideration of the four objectives in developing and recommending a rate methodology. The rate structure must take into account the fact that the digital media industry is in its initial stages of development and that the goals of achieving the relevant elements set out below requires balancing incentives and compensation on both sides of the marketplace while providing for sufficient returns:

- Maximizes availability of creative works
- Afford copyright owner a fair return
- Afford copyright user a fair income
- Provides for:
 - Creative contributions
 - Technological contributions
 - Capital investments
 - Costs, risks and contribution to opening of new markets for creative expression and media for communication

- Limit disruption to industry

109. Central to the achievement of the goals is a mechanism that focuses on the maximization of creative works in a sustainable economic model. There are two fundamental aspects to achieving the maximization of creative works – inducement to the composer to create the works (e.g., by increasing the number and diversity of artists and/or encouraging individual artists to be more prolific) and connecting the ultimate music consumer to the broadest array of music. Each of these have both short run and long run features – the greater the distribution and sale of a broad diversity to larger audiences of creative works, the greater is the potential overall return for composers. Digital music services have the property that it can make substantially larger catalogs of works available to consumers than can physical CDs. Practical experience shows that a central aspect of consumer demand for digital music is the depth and breadth of catalog, including genres and artists. Market-based mechanisms, including the increasing role of aggregators, have substantially expanded access for independent and less well known artists.
110. Thus in concept, digital music services fulfill the first objective, which is to maximize creative works, where that objective is interpreted as making available the works that are in existence.
111. With regard to motivating or providing the incentive for artist to create new works, I have considered the fact that this motivation potentially stems in part from compensation and in part from obtaining an audience. Review of the empirical analyses shows that compensation for the copyright holder in a digital world is complex – to the extent that music is legally downloaded and a royalty is paid, some compensation is forthcoming. Clearly for many composers and many works, the volume of music purchased is substantially greater than with physical CDs or other physical media. It also appears to be the case that sampling of works or individual downloads generate some additional promotion of sales, some of which is captured by digital music companies (although not necessarily the same company doing the

promotion) and some by physical CDs. To the extent that purchases occur as opposed to illegal downloading, there will be positive compensation.

112. Royalties must be set using metrics that make the business model and type of access to creative works “neutral” to encourage the variety and development of digital technologies to access creative works. Royalty setting should recognize that legitimate digital media competes against illegal pirate digital music whereby the copyright owner does not receive compensation from his/her creative development. To provide appropriate economic incentives, royalties should recognize the constraint on pricing that the copyright user faces to encourage legitimate use of copyrighted material. Royalties should also recognize the potential of copyright “stacking” that may discourage the use of copyrighted material.
113. The amount of compensation is clearly dependant on the level of the royalty. In the digital industry, unlike in the 1980s, setting royalty rates too high runs the risk of substantially reducing the expected volume of music purchased. Given the very high fixed costs, the importance of continued and expanded marketing, and the price sensitivity of customers due to piracy, higher royalty rates risk financial imbalance for digital media companies. Thus, a lower royalty rate has a greater probability of achieving both the first and the second objectives, in part by securing the third and allowing companies to expand.
114. I next considered the elements of a rate structure that would provide for economically sustainable digital models as well as sufficient compensation. I considered a large array of potential alternatives, including per unit, and multi-tiered.⁷⁶ I concluded that

⁷⁶ In evaluating proposed rate structures, I conducted an evaluation of the application of the current statutory rate on download and subscription services, and for comparison, physical sales of CDs, and concluded that this would lead to royalties as a percent of the retail price much higher than those recently reached in the UK settlement, which was for a blanket license encompassing a much broader array of rights, and those rates that prevailed in the 1981 proceeding and 1997 settlement agreements. The current statutory rate applied to a subscription model shows a lack of net neutrality associated with this type of compulsory rate. Based on a typical number of demand plays, the compulsory rate has the potential to far exceed the revenues generated by the subscription fee. To cap royalties even at a breakeven point, ignoring all other costs of goods sold, requires usage to be capped at levels less than half of some current levels.

revenue attributable to use of the work represented the single economic variable that captured well the economic growth potential and hence compensation and that linked the two sides of the market together. It has the greatest potential to provide increased compensation as the marketplace expands and to deliver this to the copyright holder, while avoiding the potential disruptive force of a per unit cost where revenues may be low.⁷⁷ It also has the virtue that it is neutral to mode of delivery, unlike a per unit approach, which would tend to place a higher percentage cost on subscription.

115. It is also the case that revenue is more readily measured, although not without its complications. A precise definition of revenue, both generally and cross time and companies, may be complicated by which specific revenues to include. I have reviewed the various company data, and I am continuing to consider the precise boundaries of revenue, but believe that the common principle should be to define revenues as those generated by the delivery of the musical works subject to the statutory license. In general, this definition should be sufficiently flexible to accommodate new business models yet defined. Revenue-based methodologies may still yield potential issues in circumstances in which costs and risks are high. Thus, I turn to rates.

116. I initially considered the issue of differential rates for various forms of downloads, including promotional or free downloads, permanent, and conditional or tethered downloads. While in principle one could consider a rate for each of these, in my

This analysis shows that the current scheme based on a fee per musical work is not a viable scheme for this marketplace. See General Appendix for analysis. I note that the United States and Canada are among the very few countries where mechanical royalties are based on a cents per track rather than percentage basis. See General Appendix for chart showing determination of mechanical royalties as of 2001. Source: NMPA International Survey of Music Publishing Revenues, National Music Publishers Association, Inc. and the Harry Fox Agency, Inc. 2003, p. 14. In addition, I understand that all participants in the current Canadian proceeding are recommending a percent of price/revenue royalty scheme.

⁷⁷ I take note of the fact that the current DPD rate of 9.1 cents per song represents 9.2% of the typical track price of 99 cents. This royalty rate increase of 5.1 cents per song from 1981 is the result of adjusting for inflation. In contrast, the price of a CD in 1983 averaged \$21.50 and contained an average of about 10 tracks, and has fallen to \$14.83 (with about 15 tracks on average) in 2005. See General Appendix for chart showing effect over time of the inflation-adjusted royalty rate as a percent of a CD sale.

view, the key distinction to be drawn is between permanent and conditional downloads. The latter typically occur in the context of subscription models where pricing is on a monthly basis and where the access rights of the subscriber to works over time are differentiated from those of a permanent download. Potential copyright stacking by licensors for the same composition increases the costs faced by subscription services, which is cognizable under the statutory objectives. Subscription services also potentially bear higher administration costs than digital stores because of the monthly subscription business model and need to verify each month continuation of payments. To the extent this results in a higher payment by consumers for a tethered copy than otherwise would be the case, the percentage assessed on the copy payable to the same copyright owner should be lower. As I discussed earlier, these differences in risks and costs are unlikely to be fully compensated for by applying the same percentage rate to these differentiated priced products. In addition, subscription services offering conditional downloads lower the risks to copyright owners by allowing them to spread risk across the entire digital catalog and user base. For these reasons, these differences suggest a somewhat lower rate is appropriate for conditional downloads relative to physical CDs or permanent downloads.⁷⁸

117. Finally, I reviewed information with regard to the appropriate range of rates that would provide meaningful compensation, but also reflect reasonable levels of costs. In this regard I modeled a number of different scenarios using Jupiter and IDC data and various rate structures, including the percent of revenue rates in the range from the 1980 proceedings for permanent downloads. All provide an estimated meaningful volume of royalty payments.⁷⁹

⁷⁸ The existence of higher royalties paid to the record labels for permanent downloads relative to those for conditional downloads is additional information relevant to consideration of differences for these two types of downloads.

⁷⁹ See General Appendix for royalty scenarios. These analyses are based on industry analysts' forecast of future physical and online digital music sales. This analysis is provided for illustrative purposes to show the relative magnitude of revenues that various royalty rates could generate for copyright owners and not as a prediction that such royalty payments would in fact be generated.

118. I also considered the issue of whether there should be some minimum amount or threshold set per work and determined that a single minimum is difficult to develop and apply in a highly differentiated industry with a wide variety of business models where the exact works are widely available at no cost on pirate websites. Moreover there is the risk with minimums that establishment of too high of a threshold results in high costs for providers, which tends to make entry or expansion more costly and can potentially be disruptive. If the goal of a minimum is to achieve some “certain” amount of revenues, it appears that a percentage of retail revenue approach provides revenue streams with less risk of disruption or risk to entry. Under a percentage of retail revenue approach, as long as the entity is earning positive revenues from its services, there will be a portion of those revenues flowing to the copyright holders.
119. I cross checked my conclusions by reviewing interim agreements negotiated by the digital music companies with music publishers in anticipation of the compulsory rate setting proceeding. Compensation for mechanical rights for digital music service providers is in limbo awaiting the outcome of this Section 115 proceeding. Some interim payments have been made pending this proceeding’s outcome and from my own conversations with industry executives, all are aware that legal obligations to pay mechanical royalties have been recognized. These interim deals do not cover all copyright owners, and the digital companies may have been in a weak bargaining position in the setting of terms, making these initial startup terms of lesser value as benchmarks for determining future terms and rates. My analysis and discussions with digital music service providers indicate that early on, market participants realized that a set cents per unit fee was not an optimal royalty fee structure in a highly volatile and evolving industry such as digital music.

C. Rate Recommendation

120. Based on this evaluation, I have made preliminary recommendations with regard to rate structure and rates:

1. *The proposed rate should be based on a percentage of retail revenues and not a per unit basis.* A percentage of retail revenue structure provides a

mechanism to allow for copyright users and owners to share in the actual gains from expansion of digital sales, while allowing for a cost structure that promotes such expansion and financial viability. A percentage of retail revenue approach is a preferred approach as well for the longer term duration of the compulsory rate under consideration in this proceeding because it effectively adjusts over time.

2. *The revenue measure should capture actual revenues from the sale of music subject to Section 115, and hence should include the sources of revenue that the digital music service generates directly from its music business.* The appropriate revenue definition should meet the principle that it allows for different sources of revenue, but should not be so broad as to encompass adjacent but not directly related businesses. This is particularly important since several digital music companies are not “stand-alone” entities and the principle should be applicable across all companies.
3. *Setting a rate at a level appropriate for achieving a fair income for the copyright holders while achieving the other three objectives suggests that a rate in the 4% to 6% of retail revenue range, and, more appropriately at the lower end of that range, would better achieve the four objectives set forth in 801(b)(1).* This recommendation takes into consideration the fact that royalty costs account for a considerable proportion of overall costs for digital music firms. While there is no precise rate estimate in this range that dominates all others, a preferred rate outcome is at the lower end of the range because the risks and costs associated with erring with a rate set too high outweigh the risk of setting a rate too low. Finally, rates in the 4-6% range are consistent both with the four objectives and with other arrangements I have reviewed, although there is no exactly comparable circumstance among these other arrangements.⁸⁰

⁸⁰

With regard to the percentage of revenue, I note that the rate structure as of 1980/81 would have generated a 5% of revenue estimate at its implementation. Moreover, 1980/81 was a period of the industry that was a more robust and less risky environment.

4. *The rate structure should also take into account relevant differences between permanent and conditional downloads, which supports an incremental and not significant difference in rates so as to maintain the overarching principle of rates at the low end of the range;*

- First, the ownership rights that are conveyed by permanent downloads are more similar to physical CDs than to conditional downloads.
- Second, conditional downloads reflect a more nascent form of music consumption and riskier business model. They entail getting consumers to adopt the concept of on-line consumption and non-permanent ownership. While with permanent downloads, customers can enter and exit the marketplace essentially seamlessly; the choice of consuming via conditional downloads means that the “cost” of exit (e.g., the decision to cease subscribing) is loss of all value (downloads) purchased. This involves a potential negative perception that the consumer will need to start all over from scratch, which in turn must be overcome with marketing and education about the service.
- Third, the potential exists for copyright “stacking via multiple rights” in the current environment of legal uncertainty over what rights are conveyed.
- Fourth, overall, subscription services reduce the risks of copyright owners by spreading the risk of investment across the entire catalog as well as across users.
- Revenue differences resulting from lower pricing of conditional downloads are likely insufficient. The differential rates would afford substantial compensation for copyright owners while promoting expansion of creative works and the digital music industry as a whole. Differential rates would still provide substantial returns to copyright owners and adequate compensation to industry participants.

121. I conclude that a minimum royalty rate would not advance the objectives of Section 801(b) (1). Per unit minima pose substantial risks to entry and expansion of firms, particularly given the uncertainty about successful technologies and continued pricing sensitivity due to piracy and the availability of free music. A percentage of retail revenue standard should provide sufficient and predictable compensation to copyright holders to satisfy the fair return standard without recourse to minima. Empirical testing of the dollar royalties from these rates demonstrates that it would provide substantial returns to copyright owners and adequate compensation to the industry participants.

IV. Conclusions

122. Economic analyses of the digital media industry, including assessment of business models, investments, consumer patterns, and income and incentives for both copyright holders and users, support a rate methodology based on a percentage of retail revenues at the low end of a 4-6% range inclusive of an incremental difference for conditional downloads. This rate methodology and level satisfies the four objectives and provides a mechanism for compensation to copyright holders to increase as the digital media industry strengthens and grows.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information and belief:

A handwritten signature in black ink, appearing to read "Margaret E. Guerin-Calvert". The signature is fluid and cursive, with a large initial "M" and a stylized "G".

Margaret E. Guerin-Calvert

November 29, 2006

Appendix on UK Agreements

1. To fully access the implications of the UK settlement agreements, one must first understand the similarities and differences between the rights and obligations of the parties in the UK associated with the royalties being paid compared with such rights and obligations of the parties in the United States.⁸¹
2. I also examined differences in the two digital music services markets in the United States and the UK that bear on the establishment of a U.S. compulsory royalty rate. In particular, my discussions with industry executives and review of data indicate that the U.S. is by far the largest and most advanced market for digital music services. Many digital companies developed their services first in the United States and then “exported” these digital music services to other countries, including, for example, the UK. The initial capital investments and associated risks of developing these business models and digital music offerings were incurred in the United States.
3. Once these models proved successful in the United States, incremental capital investments were made to export these services to other geographic markets. This is an important factor with respect to the third statutory objective, relative contribution of the copyright owner and user to developing new markets and maximizing creative works. The larger the capital investment, the larger the possible risk. The larger the potential risk, the larger the expected return on that investment in order to make the initial capital investment at risk make economic sense. The bulk of the initial risk is incurred in making the digital music service operative in the United States. The incremental capital investment necessary to export the proven business model to other countries suggest a lower necessary return on that investment. This would tend to support the position that the returns to the initial capital investment should be greater

⁸¹ I understand that the UK agreements encompass a blanket license that covers all necessary musical work rights, including the public performance, communication, and reproduction royalties for all internet-based music services. In the U.S., the Section 115 proceeding only covers reproduction and distribution (or mechanical) rights royalties. Public performance and communication rights are not included.

for the initial investments incurred in the United States, thereby supporting a higher margin for services in the United States. This would also tend to support copyright users that have made those higher capital investments in the United States retaining a higher portion of the returns from digital music services relative to the returns in other countries such as the UK.

A

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Selected DiMA Members' Services Chart

Company	Pricing
Amazon	Physical CDs must be purchased at their retail price Music Now On Demand, offering unlimited downloads for your PC, is available for \$9.95 per month. Music Now Portable, which includes all the features of Music Now On Demand, plus unlimited downloads to a compatible portable player, is \$14.95 per month. Music Now Radio, offering thousands of stations including AOL Radio with XM, costs \$4.95 per month. Items can be purchased a la carte, with songs typically priced at \$.99 per track and \$9.99 per album.
AOL	
iTunes	Browser is free, \$0.99 per song (Discounted if entire album is purchased)
Live365	Subscription package is \$5.95 a month, \$14.85 for 3 months, \$26.70 for 6 months, \$47.40 for a year, or \$87.60 for 2 years
LoudCity	\$19.95/month depending on number of stations and size.Free broadcasts.
Microsoft	Cost of downloads from MSN are \$0.99 per song, and \$9.99 per album
MTV Networks	"Urge All Access to Go" -- unlimited downloads and radio streaming to a portable player for \$14.95 per month or \$149/year; "Urge All Access"-- unlimited downloads and radio streaming to a PC for \$9.95 per month or \$99/year;"Urge By The Track" -- \$0.99 per song to download

Selected DiMA Members' Services Chart

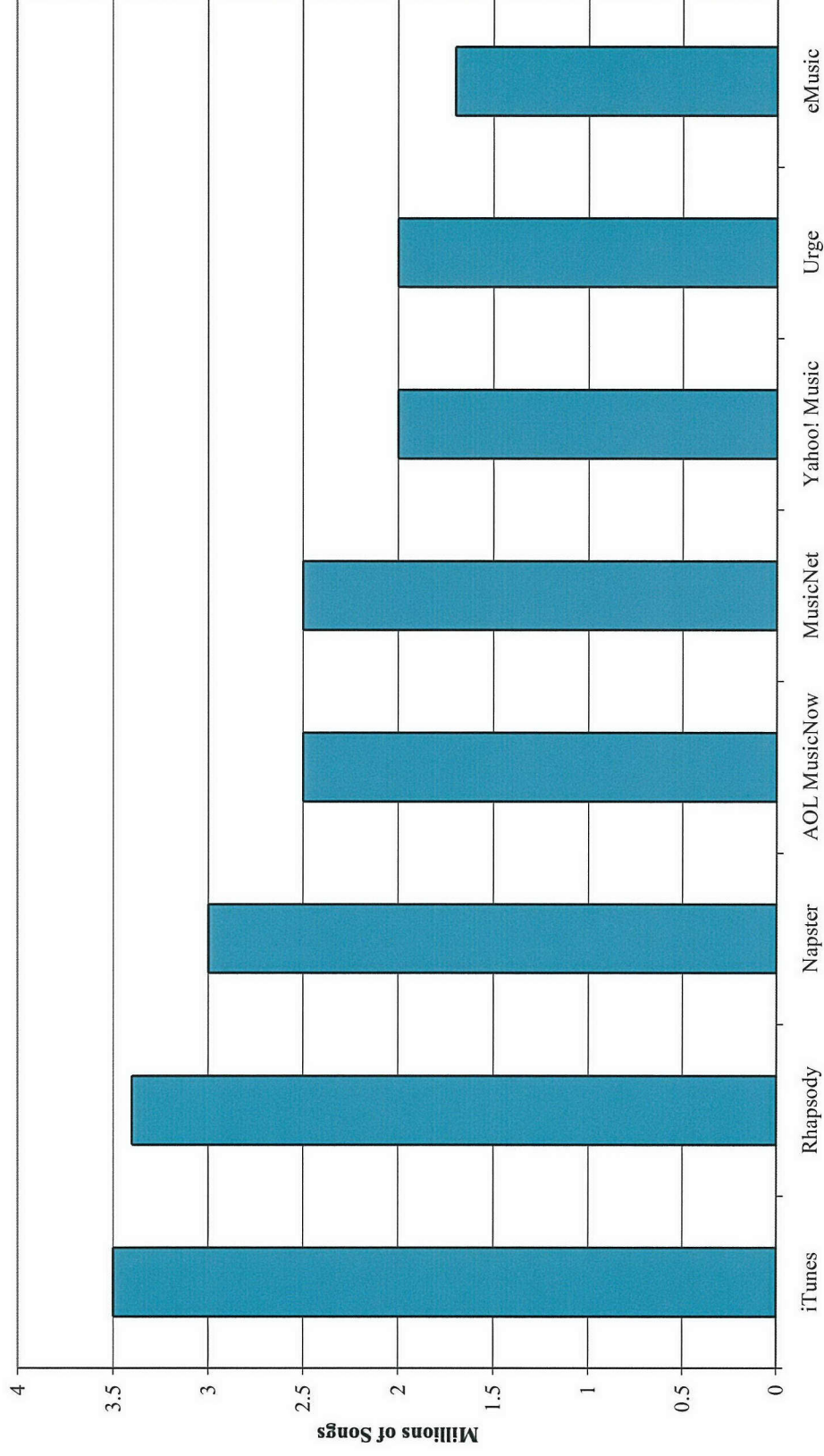
Company	Pricing
MusicNet	99¢ for singles; albums \$9.99 that burn to CD and play on compatible MP3 players. Basic Subscriptions. Unlimited downloading and streaming on the PC of all songs in the catalog (ex., \$9.95/month). Portable Subscriptions. Play subscription music on any compatible MP3 player (ex., \$14.95/month)
MusicRebellion	Free service, connects to EBay and other providers for purchase for music.
NativeRadio.com	Native American radio streaming
Pandora Media	Service will be free for advertising-based service. No advertisement service is available for \$36 for 12 months of unlimited use and \$12 for 3 months for unlimited use
RuckusNetwork	Subscription is free for students. There is a monthly fee for subscription for alumni and staff
Sony Connect	Each \$. 99 download in CONNECT Music library can be accessed on up to five different computers for no additional charge.
Napster	"Napster to go" service is \$14.95 a month
RealNetworks	The "Rhapsody Unlimited" subscription service is \$9.99 / month, the "Rhapsody To Go" subscription service is \$14.99 / month, and "Rhapsody 25" is free. RealNetworks also offers track downloads from the RealPlayer Music Store for \$.99 per track, RadioPass membership for \$59.95 / year, and access to "Rollingstone.com" music-related content for free. Other bundles of entertainment-related services (e.g. "SuperPass") also exist.
Yahoo	"Yahoo! Music Unlimited" – either one annual payment of \$59.98 (\$4.99/month) OR \$6.99/month on a month-to-month basis. "Yahoo! Music Unlimited To Go" – either one annual payment of \$119.88 (\$9.99/month) OR \$11.99/month on a month-to-month basis

**Publicly-Reported Volume of Digital Media Catalogs by
Service**

Service	Millions of Songs in Library
iTunes	3.5
Rhapsody	3.4
Napster	3
AOL MusicNow	2.5
MusicNet	2.5
Yahoo! Music	2
Urge	2
eMusic	1.7

Note: All catalogs exceed the listed amount

**Publicly-Reported
Volume of Digital Media Catalogs by Service**



Note: All catalogs exceed the listed amount

Digital Music Players Supporting "On-The-Go" Music Access, by Company
Notes: DRM stands for Digital Rights Management. Legally Purchased Music

Company	Product	File Format	Storage Capacity	Interface	Source
Aligo	A208 MP3 Player	WMA, MP3, ADPCM, WMA DRM	1GB, 2GB	USB 2.0	http://www.aligo.co.uk/ProductInformation/Aligo_A208_MP3_player_Voice_recorder_1_GB_6494675
Archos	104 Mini MP3 Player	MP3, WMA, WAV and protected WMA files (fully PlaysForSure™ audio), JPEG Photos	4GB	High-speed USB 2.0 interface	http://www.shoparchos.com/product.aspx?sku=2923531&culture=en-US
Archos	Gmini XS 100: 4GB MP3 Player	Plays MP3, WMA, and protected WMA (PlaysForSure download)	4GB	High-speed USB 2.0 interface	http://www.shoparchos.com/product.aspx?sku=2816016&culture=en-US
BenQ	Joybee 102R, 180	WAV, WMA, MP3, WMA DRM	256MB	USB	http://www.benq.co.uk/ProductInformation/BenQ_Joybee_102R_MP3_player_256_MB_6516767
Creative	Zen V and V plus	MP3, WMA, IMA ADPCM, WMA DRM, JPEG	1GB, 2GB, or 4GB	USB 1.1/2.0	http://www.creative.com/products/product.asp?category=213&sku=category=214&product=15283&nav=1
Creative	Zen Micro	MPEG Audio Layer 3 (MP3), Windows Media™ Audio (WMA) and WAV	4GB, 5GB, 6GB	USB 1.1/2.0	http://www.creative.com/products/product.asp?category=213&sku=category=214&product=10795&nav=2
Creative	Zen Sleek	MP3: Up to 320 kbps. WAV: Up to 48 kHz, 16-bit, Stereo/Mono, WMA: Up to 320 kbps, WMA with Digital Rights Management (DRM) 9 and 10	20GB	USB 1.1/2.0	http://www.creative.com/products/product.asp?category=213&sku=category=214&product=13599&nav=1
Creative	Zen Nano Plus	Audio Layer 3 (MP3) and Windows Media Audio (WMA) with DRM	512MB / 1GB built-in flash memory	USB 1.1/2.0	http://www.creative.com/products/product.asp?category=213&sku=category=214&product=12720&nav=1
Creative	MuVo Micro N200	Flash player, 512 MB, WMA DRM, WMA, MP3	256MB, 512MB, 1GB	USB 1.1/2.0	http://www.creative.com/products/product.asp?category=213&sku=category=215&product=10737&nav=1
Creative	MuVo Slim	MPEG Audio Layer 3 (MP3) and Windows Media Audio (WMA) with DRM	128MB, 256MB, 512MB, 1GB	USB 1.1/2.0	http://www.creative.com/products/product.asp?category=213&sku=category=215&product=10052&nav=2
Creative	MuVo TX	Flash player, 256 MB, WMA DRM, MP3, ADPCM	128MB, 256MB and 512MB	USB 1.1/2.0	http://www.creative.com/products/product.asp?category=213&sku=category=215&product=9672&nav=2
Dell	DJ Ditty	WAV, MP3, and protected WMA, WMA DRM (for purchase music and subscription services)	512 MB	USB	http://www.pcmag.com/article2/0,1759,1887824,00.asp
Dell	DJ 30	WAV, MP3, and protected WMA, WMA DRM	30 GB	High-speed	http://www.pcmag.com/article2/0,1759,1824772,00.asp
Digit@lway MPIO	FG100, FY400	WMA, ASF, MP3, WMA DRM	128MB, 256MB, 1GB	USB 2.0	http://www.aligo.co.uk/ProductInformation/Digit_lway_MPIO_FG100_MP3_player_Reorder_Radio_1_GB_6290306
EnCross	WaveX WV-420c	Flash Player, WMA DRM, WMA, Ogg Vorbis, WMA, MP3, ADPCM, WMA DRM	256 MB	USB	http://shopper.cnet.com/4014-6490_9_
INOVIX	IMP-64	Plays music, video, photos and more, Supports subscription music services	128MB	USB 2.0	
iRiver	Clix	MP3, WMA and OGG music files, supports subscription music services	2GB	USB 2.0	http://www.iriveramerica.com/prod/ultra/clix/clix-2GB.aspx
iRiver	T10 Series	MP3, WMA and OGG music files, supports subscription music services	512MB, 1GB, 2GB	USB 2.0	http://www.iriveramerica.com/prod/ultra/t10/T10-2GB.aspx
iRiver	T30 Series	MP3, WMA and OGG music files, supports subscription music services	512MB, 1GB	USB 2.0	http://www.iriveramerica.com/prod/ultra/t30/T30-1GB.aspx
iRiver	U10 Series	MP3, WMA and OGG music files, supports subscription music services	512MB, 1GB	USB 2.0	http://www.iriveramerica.com/prod/ultra/u10/U10-1GB.aspx
JVC	XA	WMA, MP3, WMA DRM	512MB, 1GB	USB	http://www.aligo.co.uk/ProductInformation/JVC_XA_MP102W
Lexar	LDP-600	Flash player, 256 MB, WMA DRM, MP3, WMA	256MB	USB, USB 2.0	http://shopper.cnet.com/4014-6490_9_31266073.html?phpr=4582&gip=1&tag=dfll.specs
Memup	Music Drive II	WMA, MP3, WMA DRM	256MB	USB	http://www.aligo.co.uk/ProductInformation/Memup_Music_Drive
MSI	MegaStick	WMA, MP3, WMA DRM	512MB	USB 2.0	http://www.aligo.co.uk/MSI_MegaStick_528_MP3_player_Voice_recorder_512_MB_6462324

cont'd

Digital Music Players Supporting "On-The-Go" Music Access, by Company
Notes: DRM stands for Digital Rights Management. Legally Purchased Music

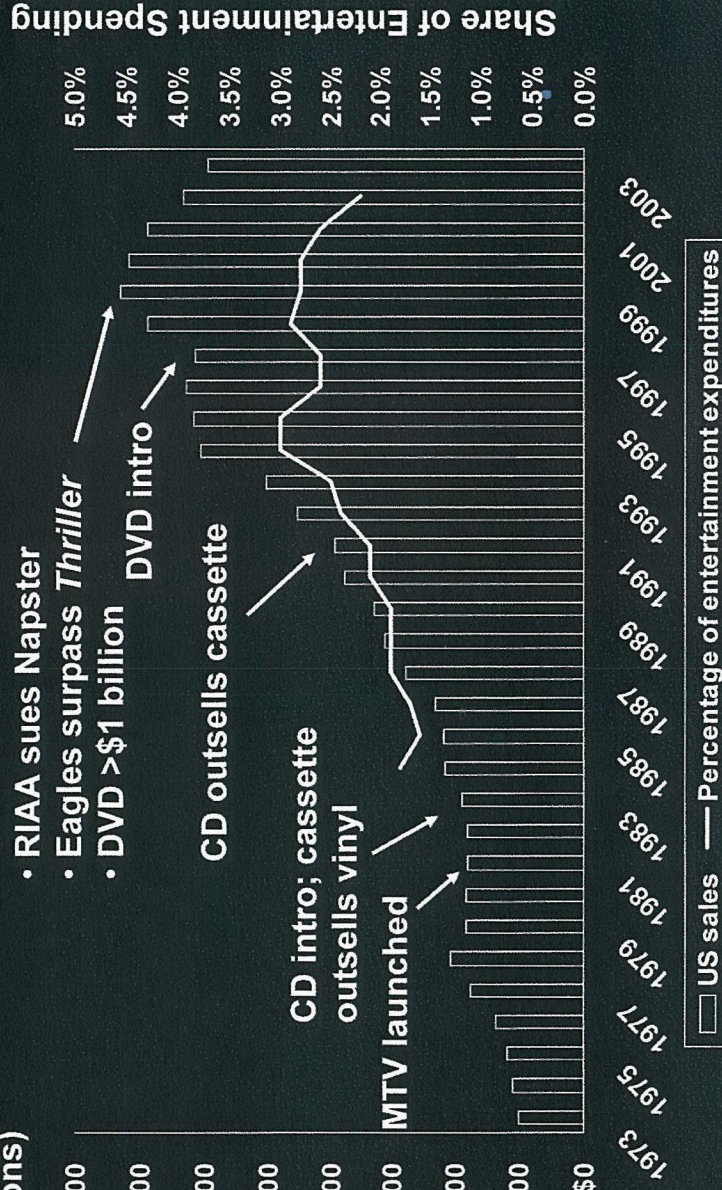
Company	Product	File Format	Storage Capacity	Interface	Source
Philips Go Gear	ShoqBox PSS110	WMA, MP3, WMA DRM	256 MB	USB	http://www.ciao.co.uk/ProductInformation/Philips_GoGear_ShoqBox_PSS110_MP3_player_Radio_256_MB_6365847
RCA	Lyra RD1072	Flash player, 256 MB, MP3, WMA, WMA DRM		USB 2.0	http://shopper.cnet.com/4014-6490_9_31236584.html?pbpt=4582&cip=1&tag=dfll-specs
Rio	Nitrus	Plays MP3, WMA, and Audible audio formats, supports online music purchases	1.5GB	USB 2.0	http://www.digitalnetworksna.com/shop/_templates/item_main_Rio.asp?model=262
Rio	Carbon	Plays MP3, WMA, and Audible audio formats, supports online music purchases	2.5GB, 5GB, 6GB	USB 2.0	http://www.digitalnetworksna.com/shop/_templates/item_main_Rio.asp?model=267
Rio	Karma	Plays MP3, WMA, and Audible audio formats, Ogg Vorbis, supports online music purchases	20GB	USB 2.0	http://www.digitalnetworksna.com/shop/_templates/item_main_Rio.asp?model=261
Rio	Forge	Plays MP3, WMA, supports online music purchases	128MB, 256MB, 512MB	USB 2.0	http://www.digitalnetworksna.com/shop/_templates/item_main_Rio.asp?model=266
Rio	Cali	Plays MP3, WMA, supports online music purchases	128MB, 256MB	USB 1.1	http://www.digitalnetworksna.com/shop/_templates/item_main_Rio.asp?model=257
Samsung	YEPP YP-F1XB	WAV, WMA, ASF, Ogg Vorbis, MP3, WMA DRM	512 MB	USB 2.0	http://www.ciao.co.uk/ProductInformation/Samsung_YEPP_YP-F1XB_MP3_player_Voice_recorder_Radio_512_MB_6551064
Samsung	YEPP YP-F1ZW	WMA DRM	1GB	USB 2.0	http://www.ciao.co.uk/ProductInformation/Samsung_YEPP_YP-F1ZW_MP3_player_Radio_1GB_6551064
Samsung	YEPP YP-T6H YP-T6X	WAV, WMA, ASF, Ogg Vorbis, MP3, WMA DRM	128MB, 512MB	USB	http://www.ciao.co.uk/ProductInformation/Samsung_YEPP_YP-T6H_MP3_player_Recorder_128_MB_6290213
Samsung	YEPP YP-U1Q YEPP YP-U1X	WAV, WMA, ASF, Ogg Vorbis, MP3, WMA DRM	512MB, 2GB	USB	http://www.ciao.co.uk/ProductInformation/Samsung_YEPP_YP-U1Q_MP3_player_Voice_recorder_2_GB_6493564
Samsung	YP-F2RQB RXB/RZW	WAV, WMA, ASF, Ogg Vorbis, MP3, WMA DRM	512MB, 1GB, 2GB	USB 2.0	http://www.ciao.co.uk/ProductInformation/Samsung_YP_F2RQB_MP3_player_Radio_2_GB_6557759
Samsung	YP-U2RQB RXB/XB/ZW	WAV, WMA, ASF, Ogg Vorbis, MP3, WMA DRM	512MB, 1GB, 2GB	USB 2.0	http://www.ciao.co.uk/ProductInformation/Samsung_YP_U2RQB_MP3_player_Voice_recorder_Radio_2_GB_6537760
SanDisk	Sansa e200 Series	Supports Subscription Music Stores	2GB, 4GB, 6GB, 8GB	USB 2.0	http://www.sandisk.com/Products/Item(2057)-SDMX4-8192-Sansa_e280_MP3_Player_8GB.aspx
SanDisk	Sansa c200 Series	MP3, WMA, WAV and protected WMA DRM, Supports Subscription Music Stores	1GB, 2GB	USB 2.0	http://www.sandisk.com/Products/Item(2063)-SDMX7-2048-Sansa_e250_MP3_Player_2GB.aspx
SanDisk	Sansa c100 Series	MP3, WMA, and Audible audio files, Supports Subscription Music Stores	1GB, 2GB	USB 2.0	http://www.sandisk.com/Products/Item(1934)-SDMX3-2048-Sansa_c150_MP3_Player_2GB.aspx
SanDisk		MP3, WMA (including secure WMA content), Audible audio file formats, Supports purchased songs from on-line music stores	512MB, 1GB	USB 2.0	http://www.sandisk.com/Products/Item(1208)-SDMX2-1024-Sansa_e140_Digital_Audio_Player_1GB.aspx
SanDisk	Sansa m200 Series	Support for MP3, WMA, and DRM WMA file formats (legally purchased music)	512MB, 1GBm 2GB, 4GB	USB 2.0	http://www.sandisk.com/Products/Item(1949)-SDMX3-4096-Sansa_m260_MP3_Player_4GB.aspx
SanDisk	Digital Audio Players	MP3, WMA, and WMA DRM (purchased music)	256MB, 512MB, 1GB	USB 2.0	http://www.sandisk.com/Products/Item(1203)-SDMX1-256-Digital_Audio_Player_256MB.aspx
ScanDisk	Digital Audio Player	MP3, WMA, WMA DRM	1GB	USB	http://shopper.cnet.com/4014-6490_9_31205937.html?pbpt=4582&cip=1&tag=dfll-specs
Storex	CLUB Mobi	WMA, MP3, WMA DRM		USB 2.0	http://www.ciao.co.uk/ProductInformation/Storex_CLUB_Mobi_MP3_ON10_MP3_player_6516822

Testimony of Margaret Guerin-Calvert

Baby Boomers, CD Upgrade Cycle Drove Music Sales to Unnatural Peak

(in millions)

Value of Shipments to Retail



The Recording Industry Association of America's Year End Statistics, Units Shipped, 1990 to 2005

Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

Notes: Manufacturers' Unit Shipments and Dollar Value (In Millions, not after Returns)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Physical																
CD	286.5	333.3	407.5	495.4	662.1	722.9	776.9	753.1	847	938.9	942.5	881.9	803.3	745.9	766.9	705.4
CD Single	1.1	5.7	7.3	7.8	9.3	21.5	43.25	66.7	56	55.9	34.2	17.3	4.5	8.3	3.1	2.8
Cassette	442.2	360.1	366.4	339.5	345.4	272.6	225.3	172.6	158.5	123.6	76	45	31.1	17.2	5.2	2.5
Cassette Single	87.4	69	84.6	85.6	81.1	70.7	59.9	42.2	26.4	14.2	1.3	-1.5	-0.5			
LP/EP	11.7	4.8	2.3	1.2	1.9	2.2	2.9	2.7	3.4	2.9	2.2	2.3	1.7	1.5	1.3	1.02
Vinyl Single	27.6	22	19.8	15.1	11.7	10.2	10.1	7.5	5.4	5.3	4.8	5.5	4.4	3.8	3.5	2.3
Music Video	9.2	6.1	7.6	11	11.2	12.6	16.9	18.6	27.2	19.8	18.2	17.7	14.7	19.9	32.7	33.8
DVD Audio									0.5			0.3	0.4	0.4	0.35	0.5
SACD														1.3	0.79	0.5
DVD Video*										2.5	3.3	7.9	10.7	17.5	29.01	27.8
Total Physical	865.7	801	895.5	955.6	1122.7	1112.7	1137.2	1063.4	1124.3	1160.6	1079.3	968.5	859.7	798.4	814.1	748.7
Total Physical to Retail Outlets																
							833.9	817.5	850	869.7	788.6	733.1	675.7	658.2	686.9	634.8
Digital																
Digital Single															139.4	366.9
Digital Albums															4.5	13.6
Kiosk																0.7
Music Video																1.9
Total Digital															143.9	383.1
Mobile																170
Subscription																1.3
Total Digital & Physical	865.7	801.0	895.5	955.6	1,122.7	1,112.7	1,137.2	1,063.4	1,124.3	1,160.6	1,079.3	968.5	859.7	798.4	958.0	1,301.8

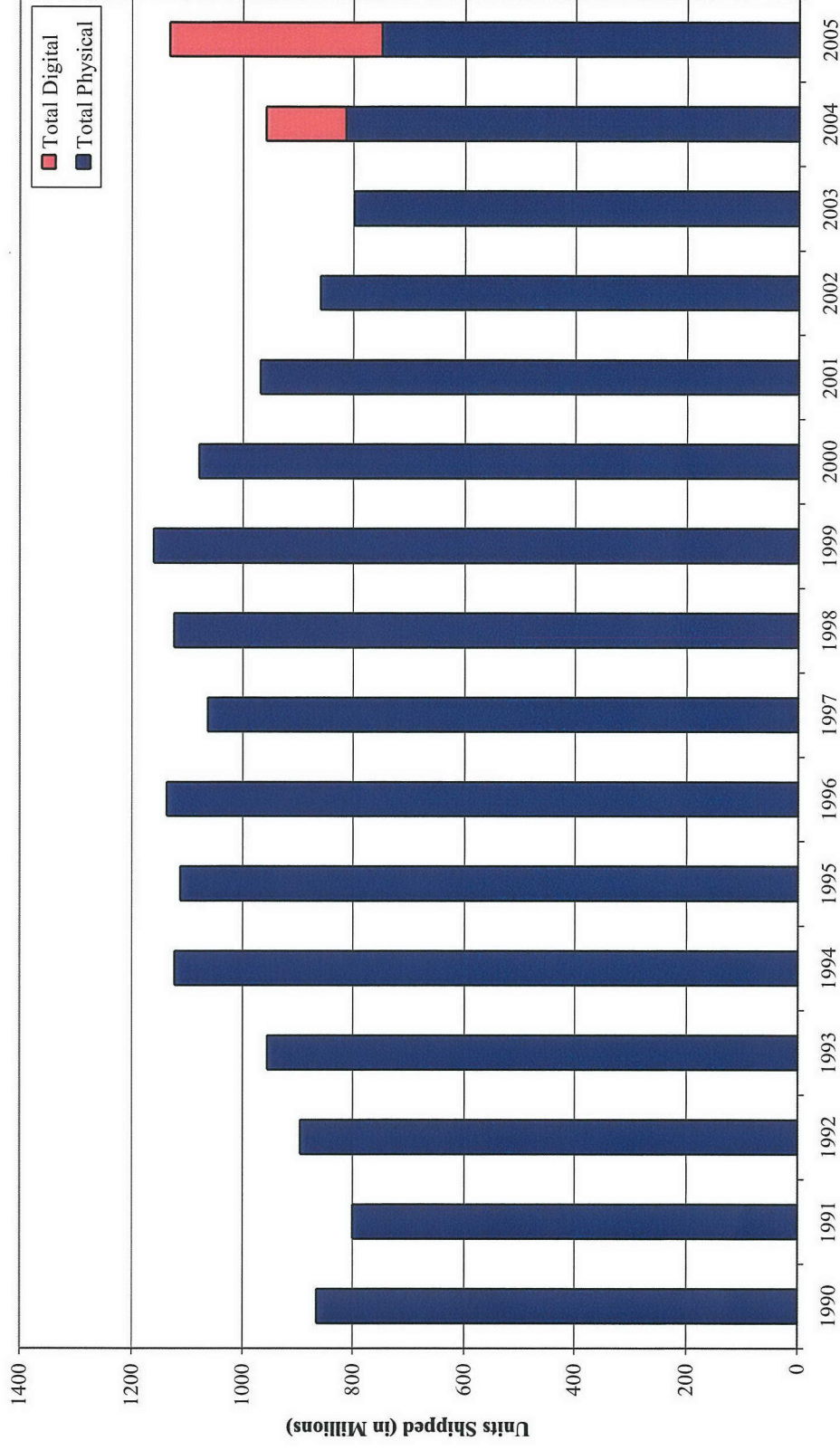
*Included in Music Video, but broken out for chart

RIAA Year End Statistics, Units Shipped by Format as a Percent of Total, 1990 to 2005



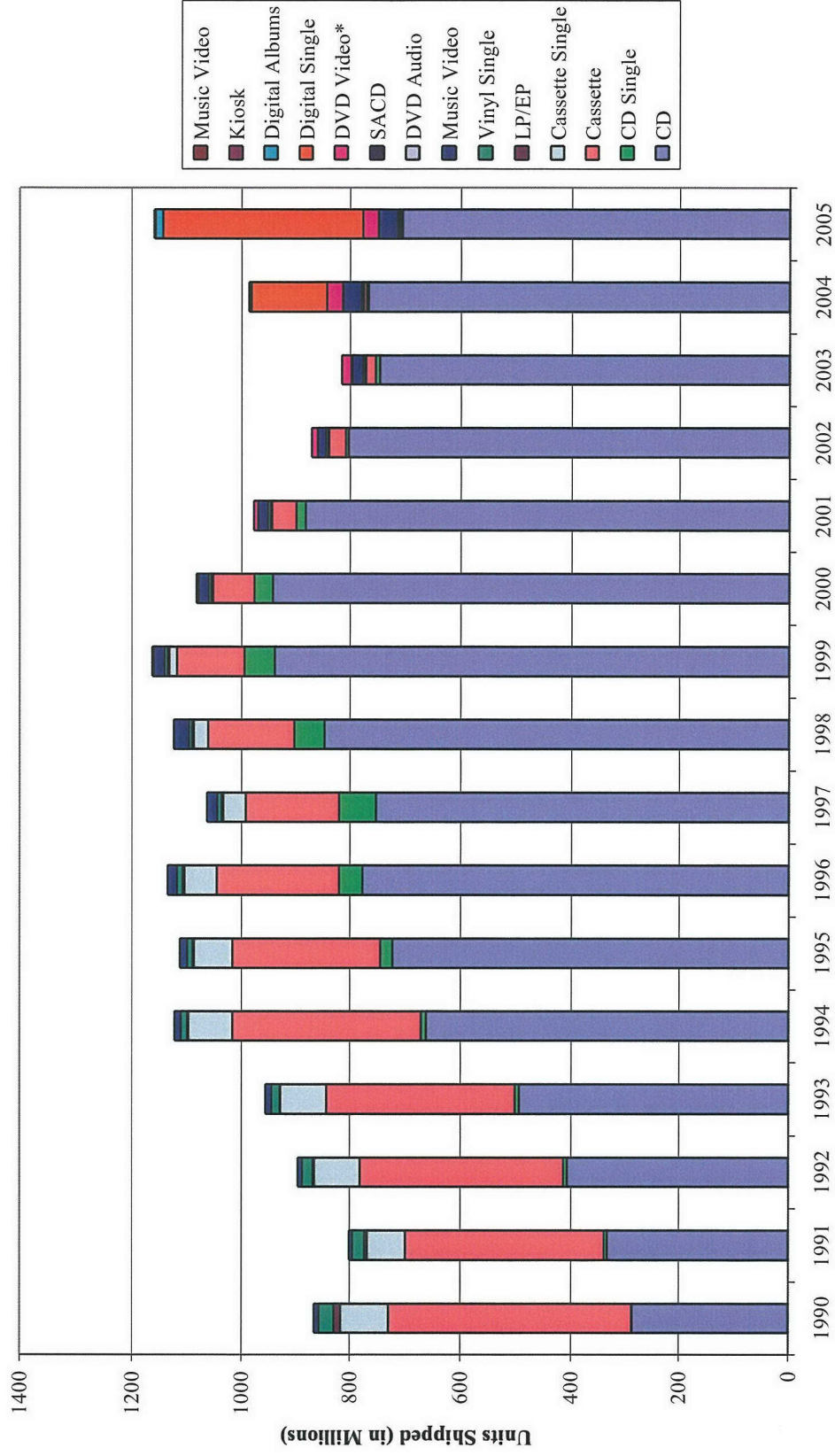
Sources: "1999YrEndStats RIAA", "2000YrEndStats RIAA", "2003YrEndStats RIAA", "2004YrEndStats RIAA", "2005YrEndStats RIAA"

RIAA Year End Statistics, Units Shipped, Total Physical vs. Total Digital, 1990 to 2005



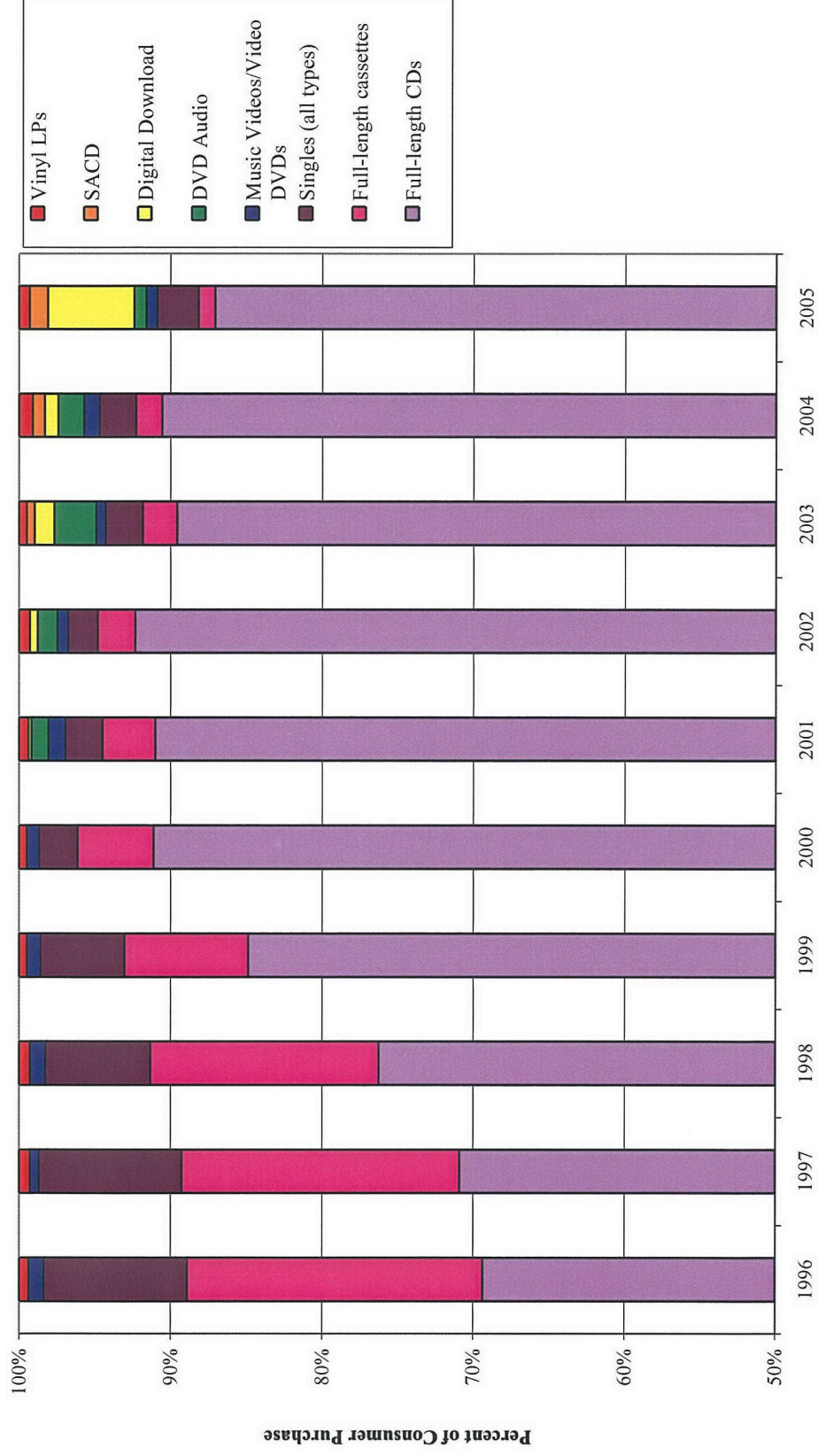
Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

RIAA Year End Statistics, Units Shipped by Format, 1990 to 2005



Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

RIAA, Consumer Profile: Share per Musical Format, 1996 to 2005
Percentage of Digital Downloads Increasing, but Still Small



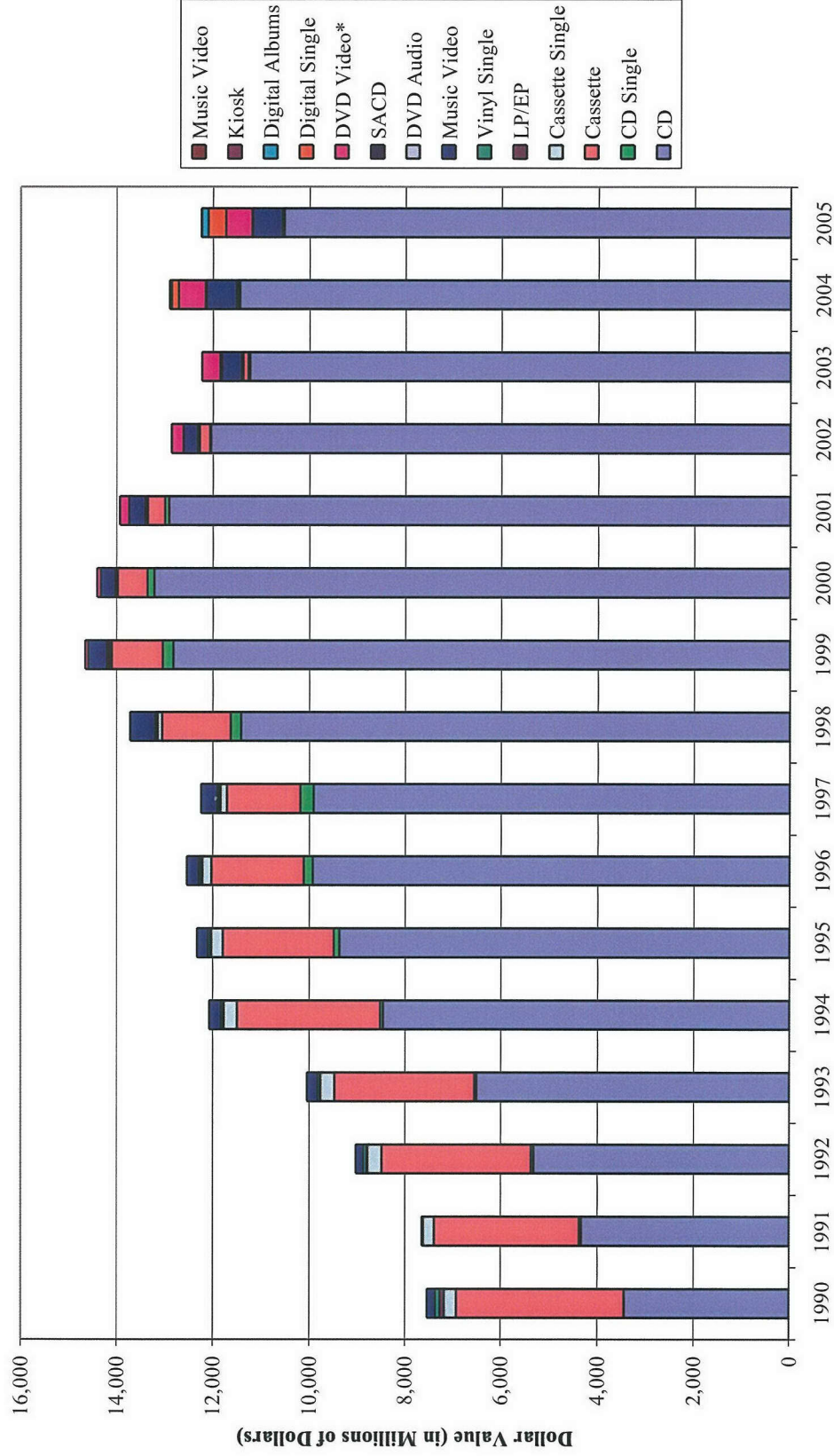
Source: "2005consumerprofile RIAA"

The Recording Industry Association of America's Year End Statistics, Dollar Value, 1990 to 2005
Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"
Notes: Manufacturers' Unit Shipments and Dollar Value (In Millions, not after Returns)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Physical																
CD	3,452	4,338	5,327	6,511	8,465	9,377	9,935	9,915	11,416	12,816	13,215	12,909	12,044	11,233	11,447	10,520
CD Single	6	35	45	46	56	111	184	273	213	222	143	79	20	36	15	11
Cassette	3,472	3,020	3,116	2,916	2,976	2,304	1,905	1,523	1,420	1,062	626	363	210	108	24	13
Cassette Single	258	230	299	299	275	236	189	134	94	48	5	-5	-2			
LP/EP	87	2	14	11	18	25	37	33	34	32	28	27	21	22	19	14
Vinyl Single	94	20	66	51	47	47	48	36	26	28	26	31	25	22	20	13
Music Video	172	8	157	213	231	220	236	324	508	377	282	329	288	400	607	602
DVD Audio									12			6	9	8	6	11
SACD														26	17	10
DVD Video*										66	80	191	236	370	561	540
Total Physical	7,541	7,834	9,024	10,046	12,068	12,320	12,534	12,237	13,724	14,585	14,323	13,741	12,614	11,854	12,155	11,195
Total Physical to Retail Outlets							10,768	10,786	12,165	13,048	12,705	12,389	11,549	11,053	11,423	10,478
Digital																
Digital Single															138	363
Digital Albums															46	136
Kiosk																1
Music Video																4
Total Digital															183	504
Mobile																422
Subscription																149
Total Digital & Physical	7,541	7,834	9,024	10,046	12,068	12,320	12,534	12,237	13,724	14,585	14,323	13,741	12,614	11,854	12,338	12,270

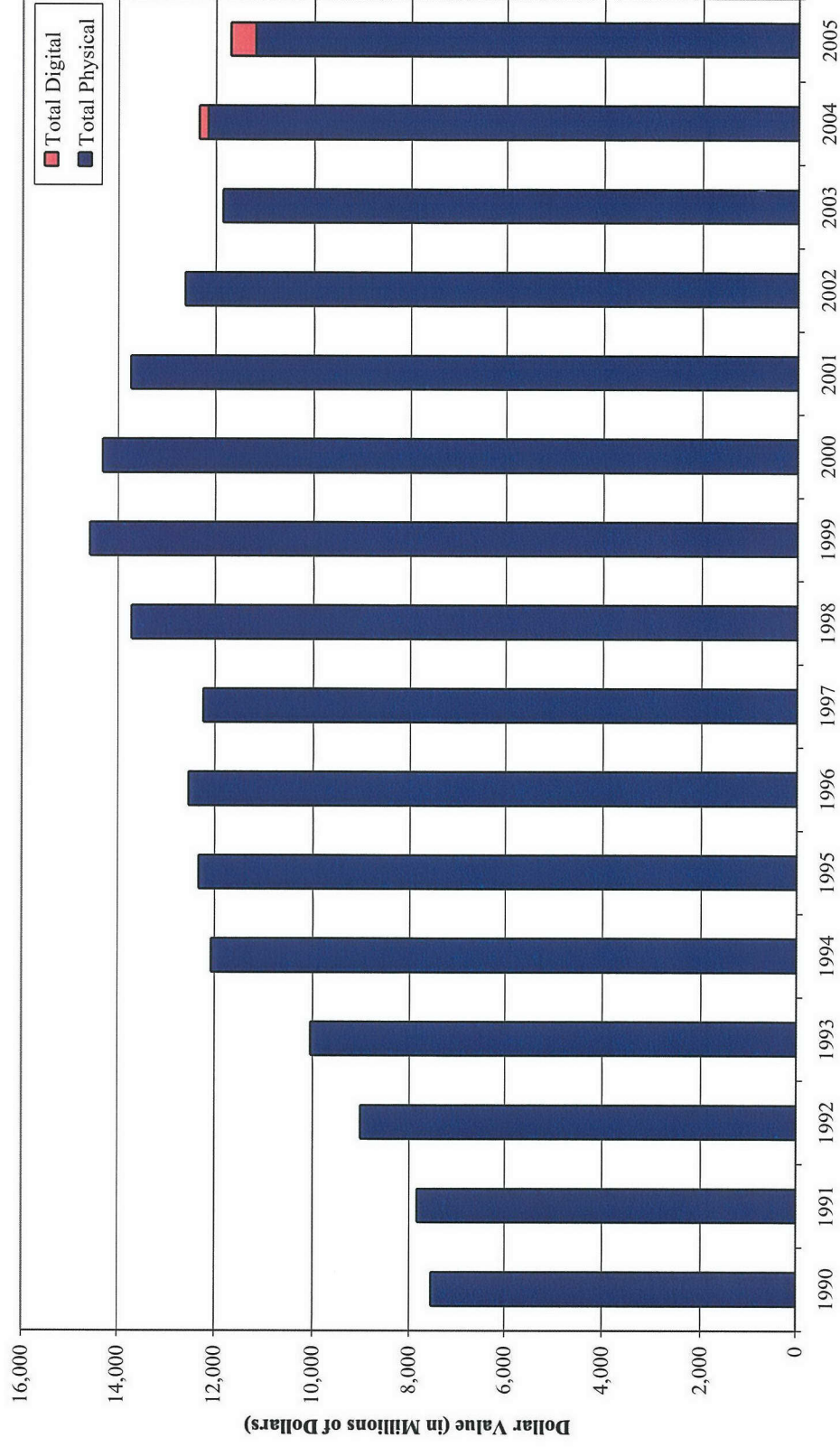
*Included in Music Video, but broken out for chart

RIAA Year End Statistics, Dollar Value by Format, 1990 to 2005



Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

RIAA Year End Statistics, Dollar Value, Total Physical vs. Total Digital, 1990 to 2005



Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

RIAA Year End Statistics, Dollar Value by Format, 1990 to 2005



Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"

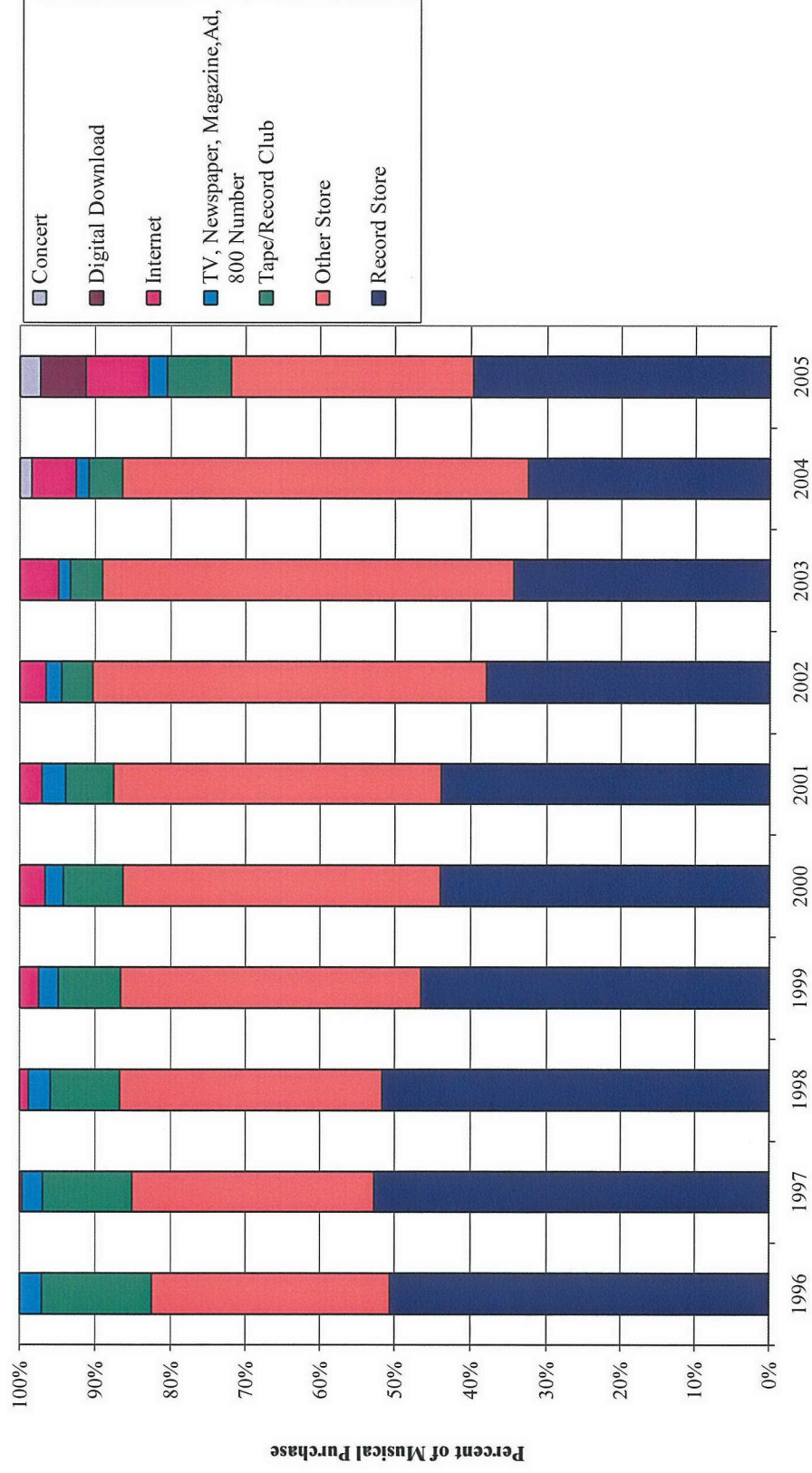
The Recording Industry Association of America's Year End Statistics, Per Unit Dollar Value, 1990 to 2005
Sources: "1999yrEndStats RIAA", "2000YrEndStats RIAA", "2003yrEndStats RIAA", "2004yrEndStats RIAA", "2005yrEndStats RIAA"
Notes: Manufacturers' Unit Shipments and Dollar Value (In Millions, not after Returns)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Physical																
CD	12.05	13.01	13.07	13.14	12.78	12.97	12.79	13.17	13.48	13.65	14.02	14.64	14.99	15.06	14.93	14.91
CD Single	5.45	6.16	6.18	5.87	6.03	5.16	4.26	4.09	3.81	3.98	4.17	4.59	4.36	4.33	4.81	3.89
Cassette	7.85	8.39	8.51	8.59	8.62	8.45	8.46	8.82	8.96	8.59	8.24	8.08	6.75	6.28	4.54	5.24
Cassette Single	2.95	3.34	3.53	3.49	3.39	3.34	3.16	3.16	3.58	3.38	3.54	3.53	3.20			
LP/EP	7.39	0.48	5.87	8.83	9.37	11.41	12.69	12.33	10.00	10.97	12.59	11.91	12.06	14.47	14.77	13.92
Vinyl Single	3.42	0.90	3.35	3.39	4.03	4.58	4.70	4.75	4.76	5.26	5.48	5.71	5.66	5.66	5.66	5.74
Music Video	18.73	1.25	20.71	19.39	20.63	17.48	13.97	17.41	18.68	19.03	15.49	18.60	19.62	20.10	18.57	17.82
DVD Audio									24.40			20.00	21.25	20.00	18.29	22.40
SACD														20.23	21.01	20.00
DVD Video*										26.52	24.33	24.14	22.08	21.12	19.34	19.42
Total Physical	8.71	9.78	10.08	10.51	10.75	11.07	11.02	11.51	12.21	12.57	13.27	14.19	14.67	14.85	14.93	14.95
Total Physical to Retail Outlets							12.91	13.19	14.31	15.00	16.11	16.90	17.09	16.79	16.63	16.51
Digital																
Digital Single															0.99	0.99
Digital Albums															10.11	9.98
Kiosk																1.43
Music Video															1.27	1.95
Total Digital																1.31
Mobile																2.48
Subscription																114.77
Total Digital & Physical	8.71	9.78	10.08	10.51	10.75	11.07	11.02	11.51	12.21	12.57	13.27	14.19	14.67	14.85	12.88	9.43

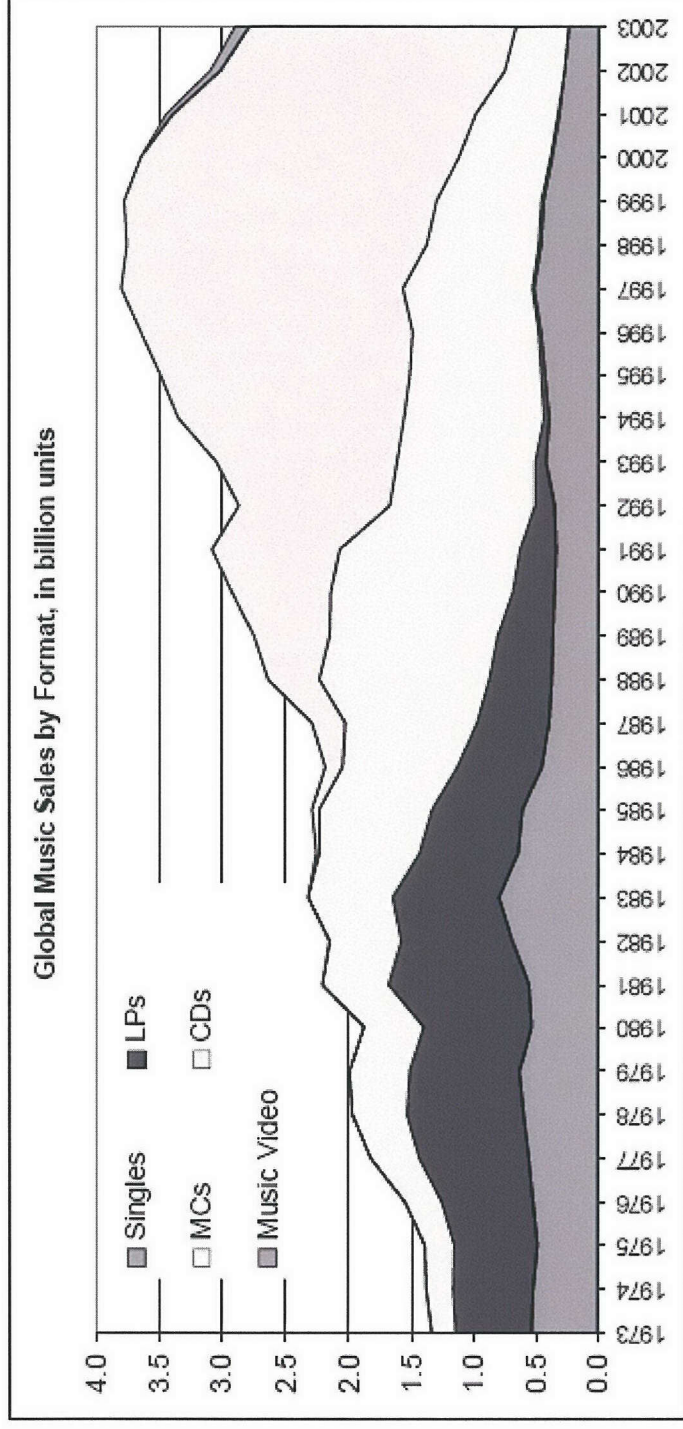
United States, The Recording Industry of America, Percent of Purchases by Type, 1996 to 2005
Source: "2005consumerprofile RIAA"

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Format										
Full-length CDs	68.4%	70.2%	74.8%	83.2%	89.3%	89.2%	90.5%	87.8%	90.3%	87.0%
Full-length cassettes	19.3%	18.2%	14.8%	8.0%	4.9%	3.4%	2.4%	2.2%	1.7%	1.1%
Singles (all types)	9.3%	9.3%	6.8%	5.4%	2.5%	2.4%	1.9%	2.4%	2.4%	2.7%
Music Videos/Video DVDs	1.0%	0.6%	1.0%	0.9%	0.8%	1.1%	0.7%	0.6%	1.0%	0.7%
DVD Audio	n/a	n/a	n/a	n/a	n/a	1.1%	1.3%	2.7%	1.7%	0.8%
Digital Download	n/a	n/a	n/a	n/a	n/a	0.2%	0.5%	1.3%	0.9%	5.7%
SACD	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.5%	0.8%	1.2%
Vinyl LPs	0.6%	0.7%	0.7%	0.5%	0.5%	0.6%	0.7%	0.5%	0.9%	0.7%
Channel										
Record Store	49.9%	51.8%	50.8%	44.5%	42.4%	42.5%	36.8%	33.2%	32.5%	39.4%
Other Store	31.5%	31.9%	34.4%	38.3%	40.8%	42.4%	50.7%	52.8%	53.8%	32.0%
Tape/Record Club	14.3%	11.6%	9.0%	7.9%	7.6%	6.1%	4.0%	4.1%	4.4%	8.5%
TV, Newspaper, Magazine, Ad, 800 Number	2.9%	2.7%	2.9%	2.5%	2.4%	3.0%	2.0%	1.5%	1.7%	2.4%
Internet		0.3%	1.1%	2.4%	3.2%	2.9%	3.4%	5.0%	5.9%	8.2%
Digital Download	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.0%
Concert	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.6%	2.7%

RIAA: Channel of Musical Purchase, 1996 to 2005

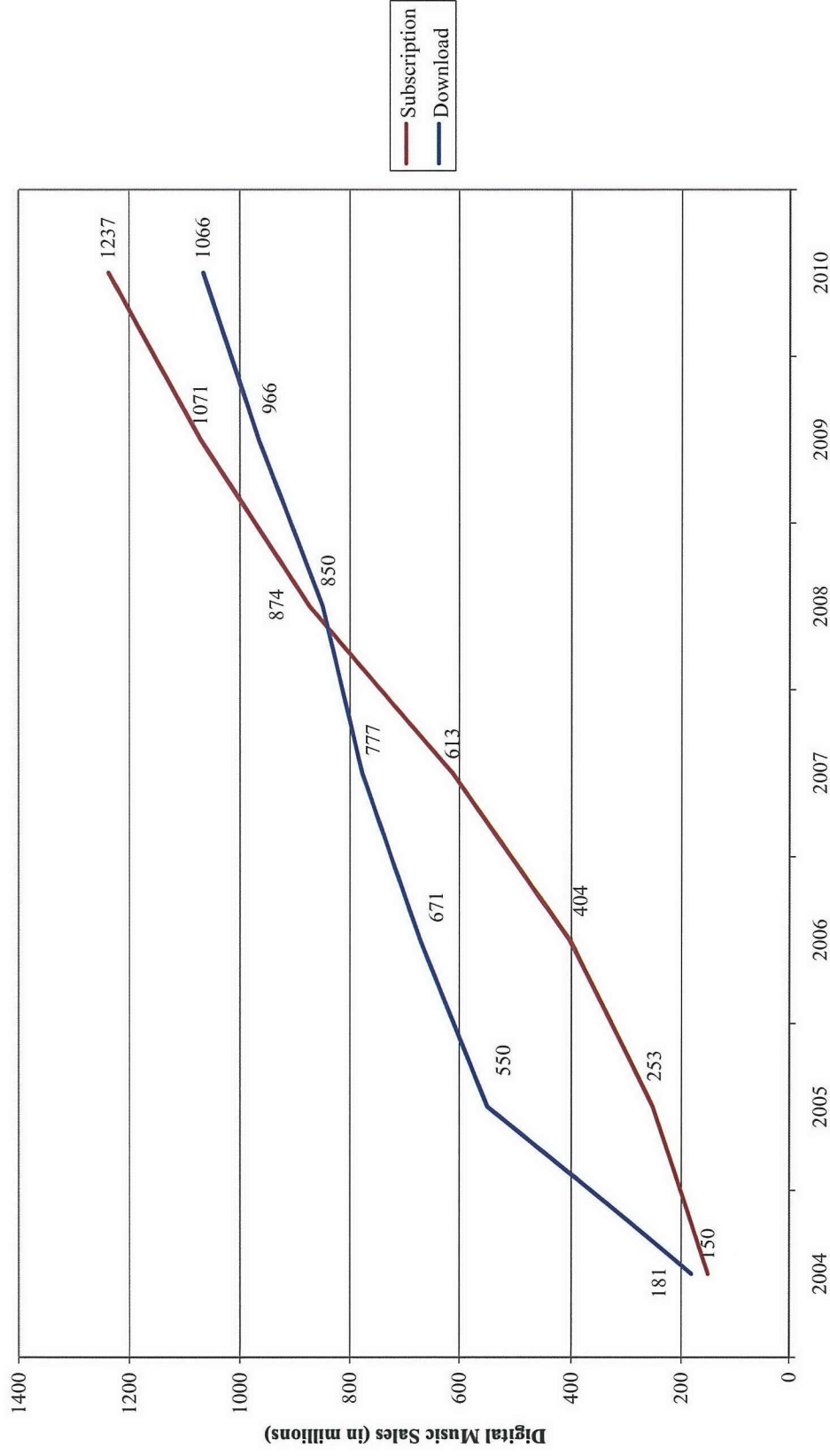


Source: "2005consumerprofile RIAA"



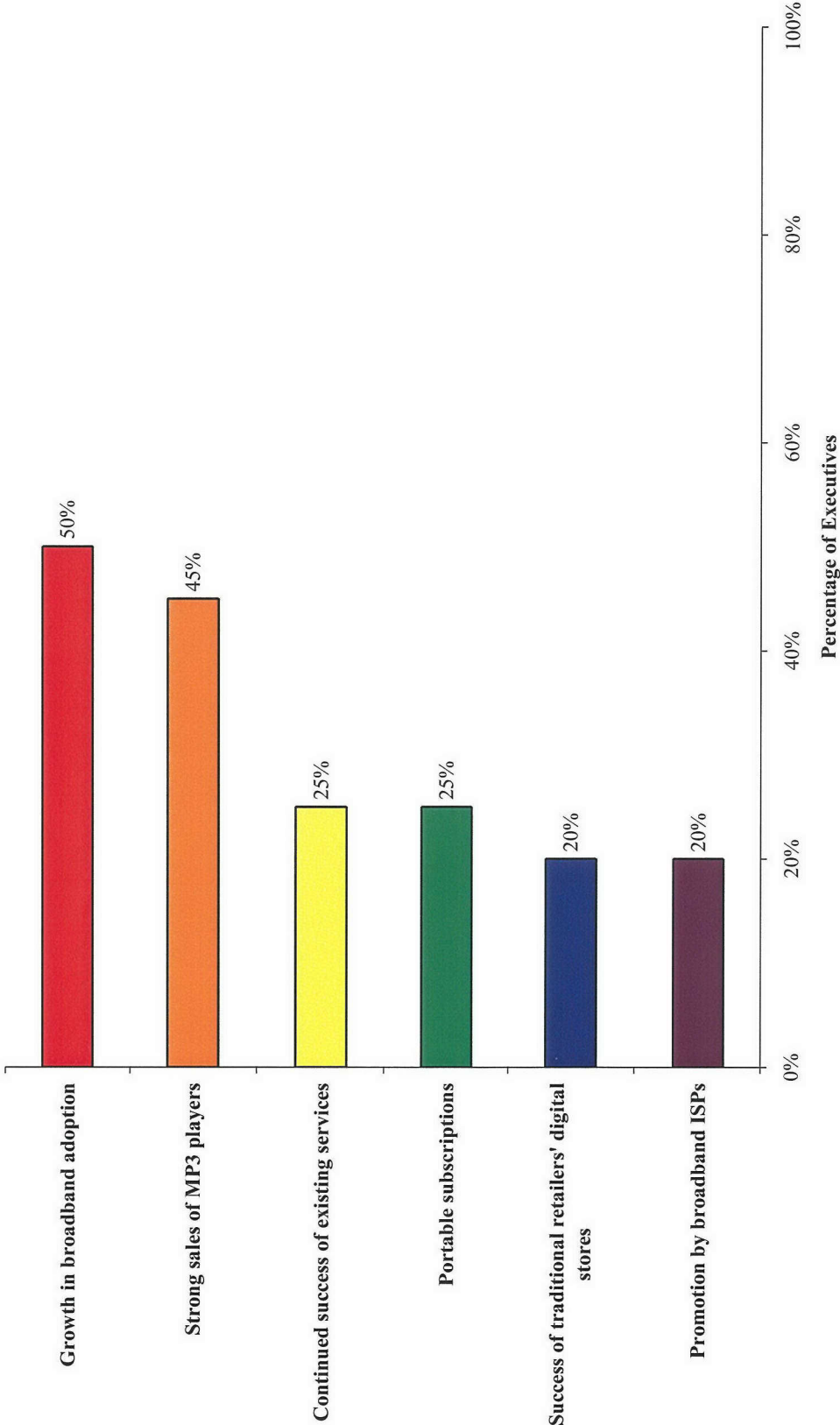
Source: OECD based on IFPI.

Download Spending Remains Small, Leading to Larger Subscription Market



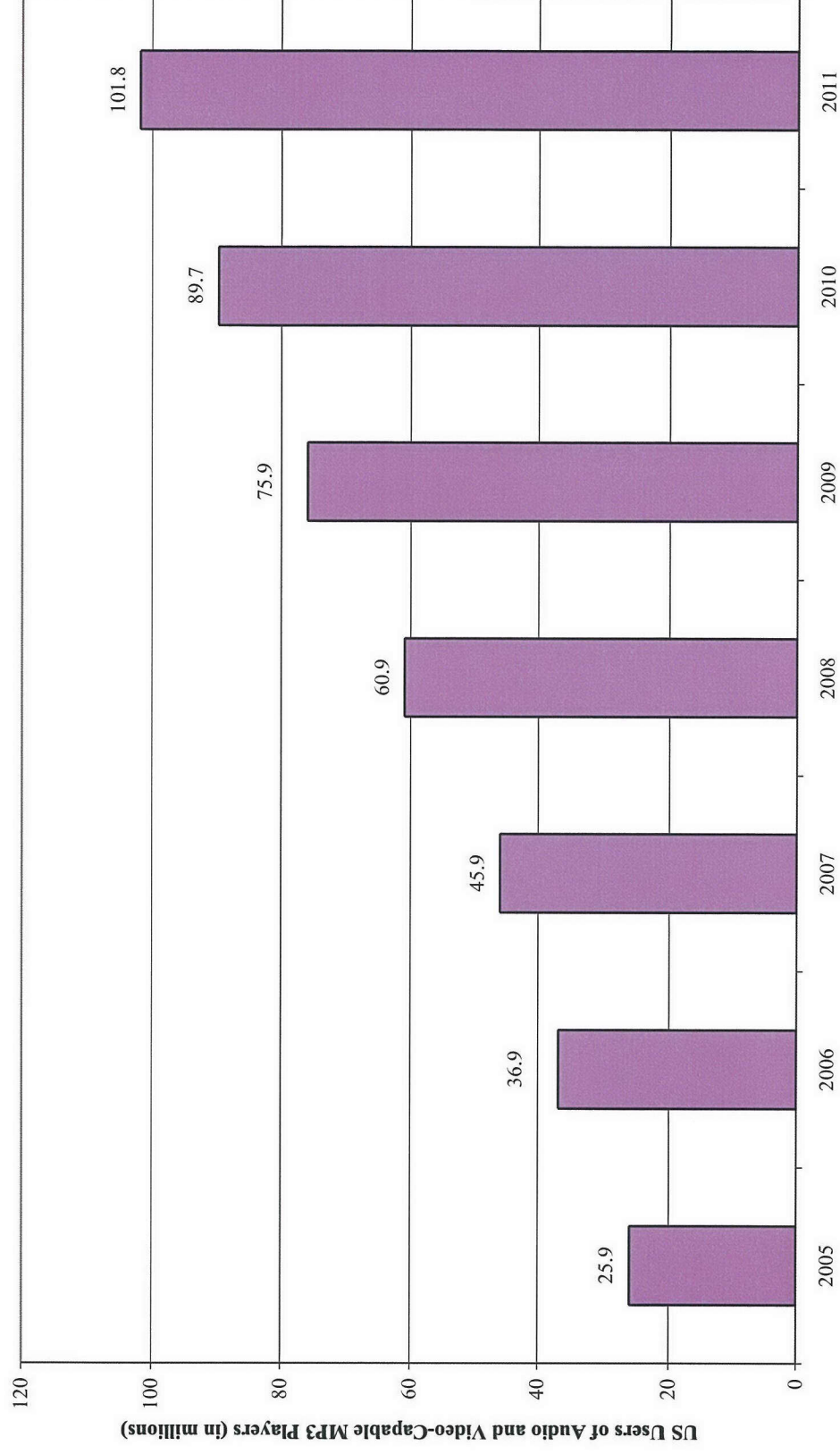
Source: Jupiterresearch "US Music Forecast, 2005 to 2010"

Executives' Top Rated Factors Having Positive Impact on Digital Music Services During Next 12 Months



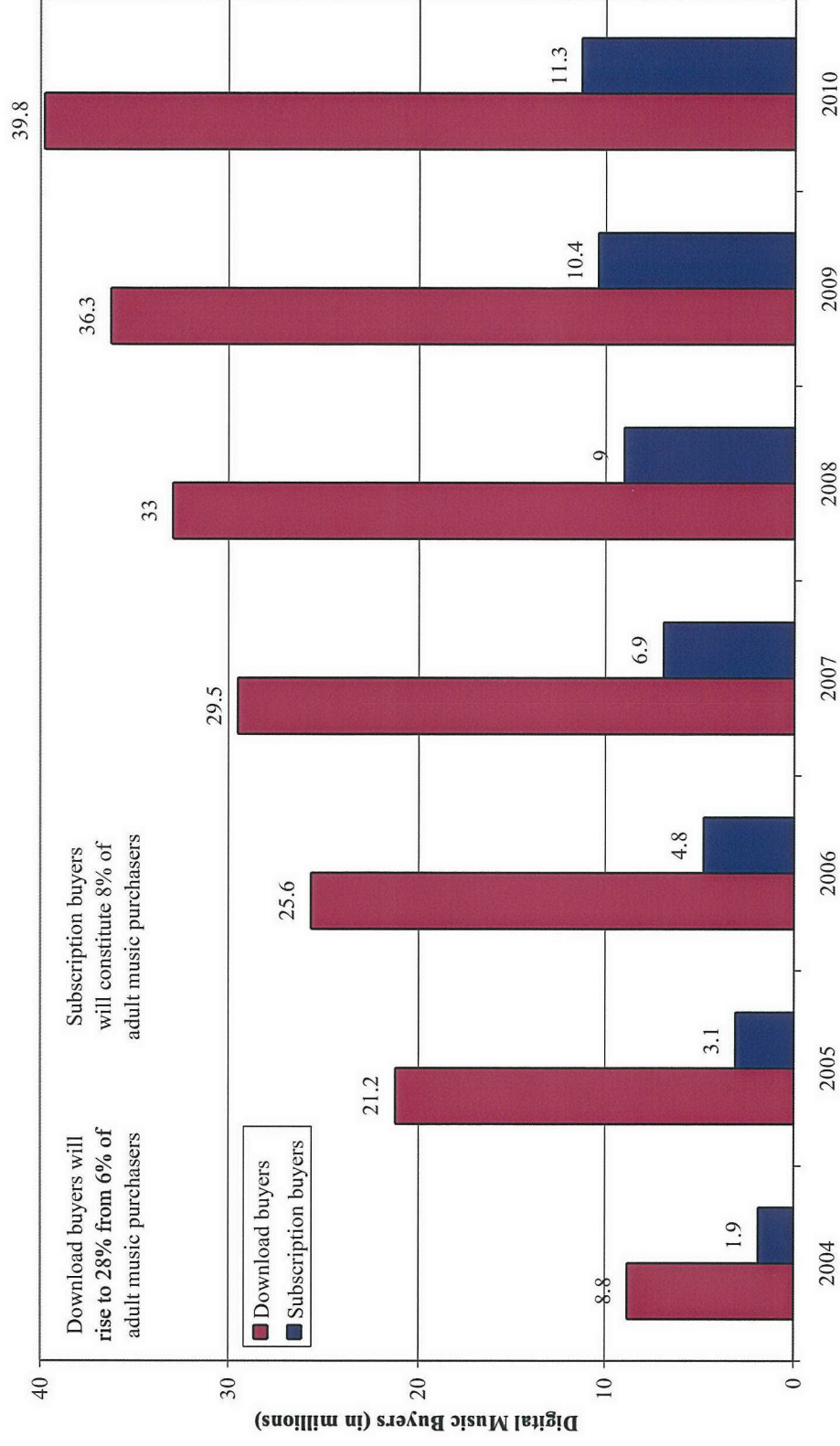
Source: Jupiterresearch "European Digital Music Value Chain"

US User Base of Portable Devices, 2005 to 2011



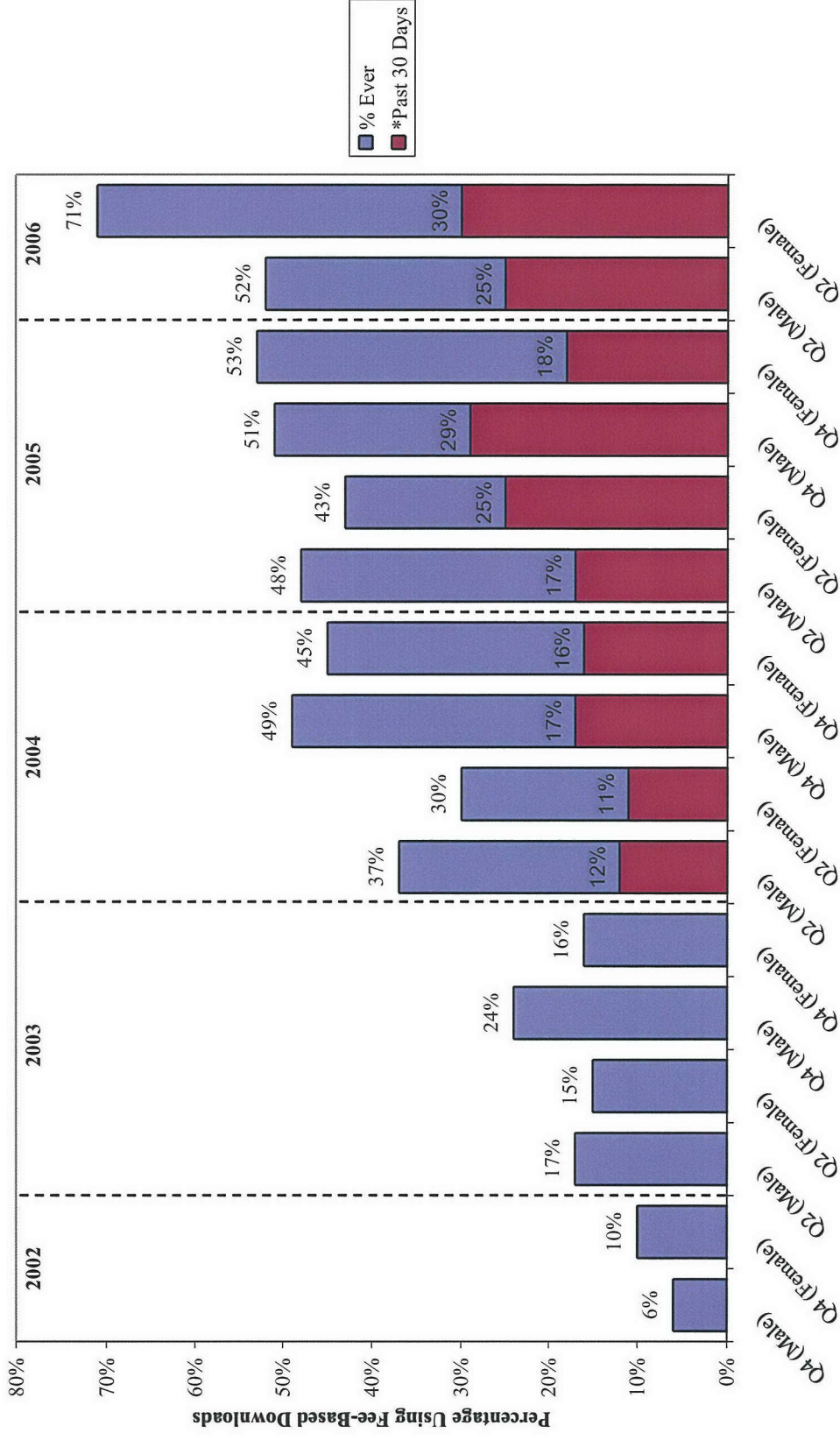
Source: Jupiterresearch "US Portable Music Device Forecast, 2006 to 2011"

Device Ownership Drives Downloading: Subscriptions Appeal to Aficionados



Source: Jupiterresearch "US Music Forecast, 2005 to 2010"

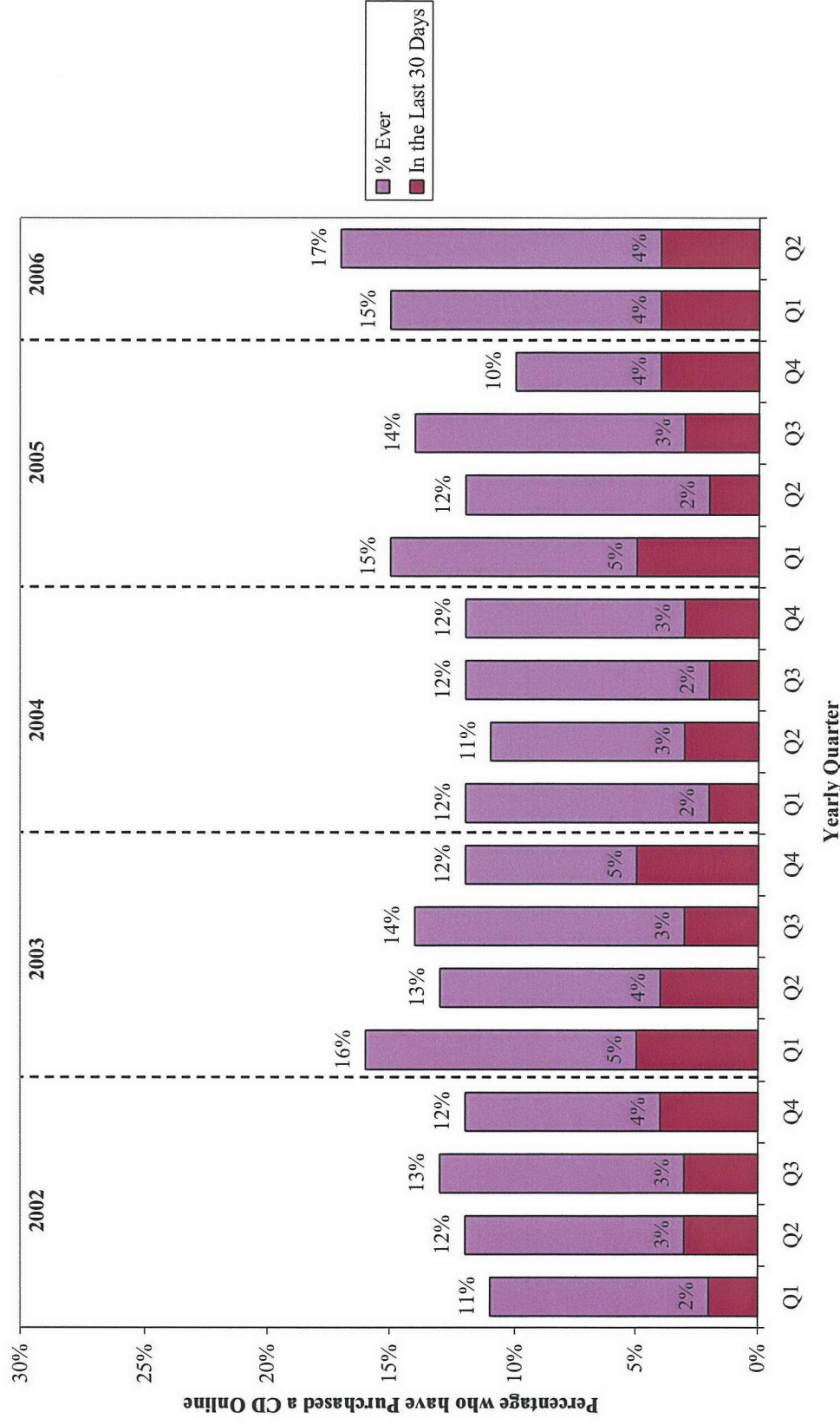
Percentage of Persons Utilizing Fee-Based Music Downloads, by Gender and Quarter, 2002-2006



Note: *Not asked prior to Q2 2004

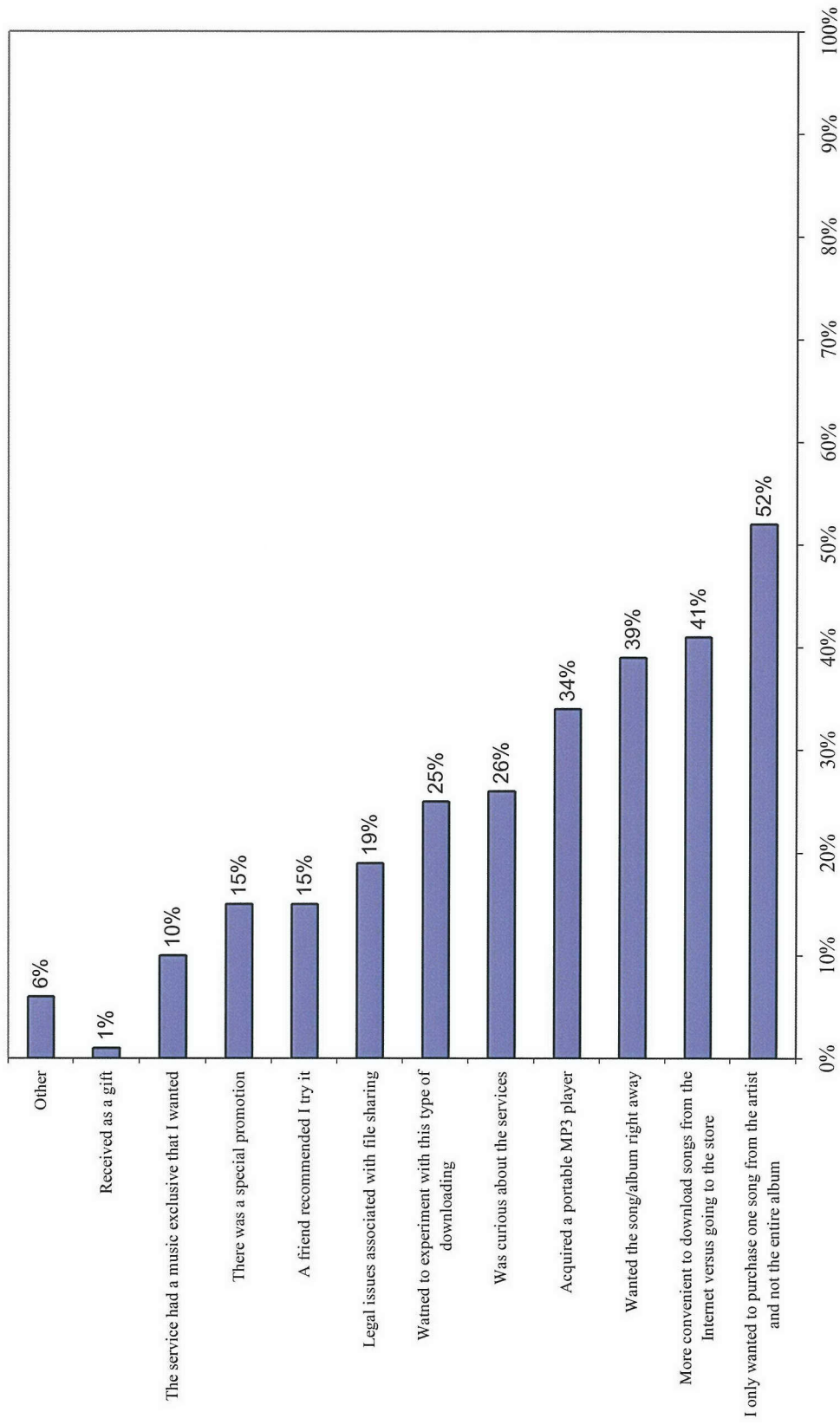
Source: TEMPO: Keeping Pace with Digital Music Behavior, Executive Summary, Oct. 2006

Percentage of Persons Who Have Purchased CDs Online, by Quarter, 2002-2006



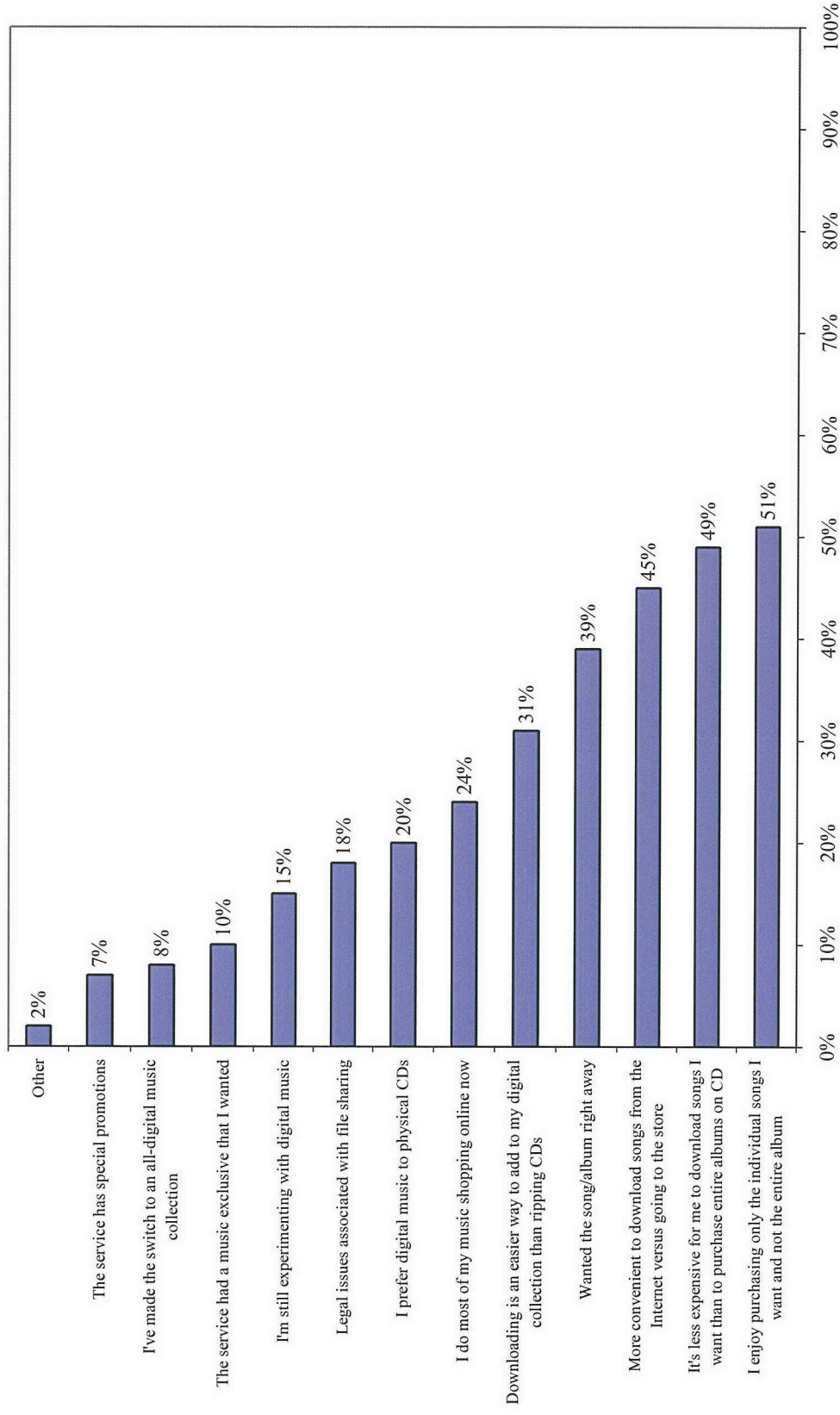
Source: TEMPO: Keeping Pace with Digital Music Behavior, Executive Summary, Oct. 2006

Reasons for First Paying for Digital Music, 2006



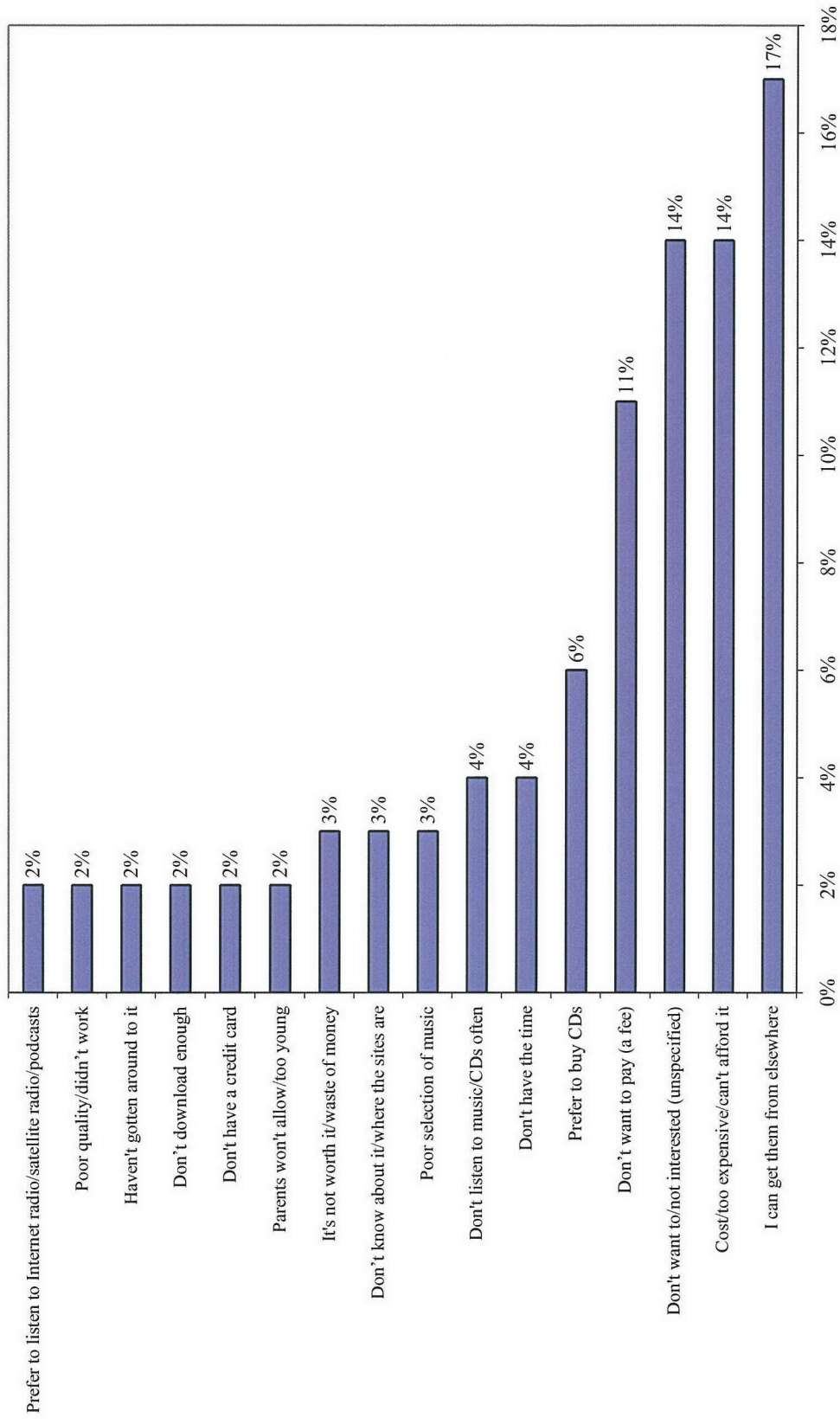
Source: *TEMPO: Keeping Pace with Digital Music Behavior, Executive Summary, Oct. 2006*

Reasons for Continuing to Pay for Digital Music, 2006



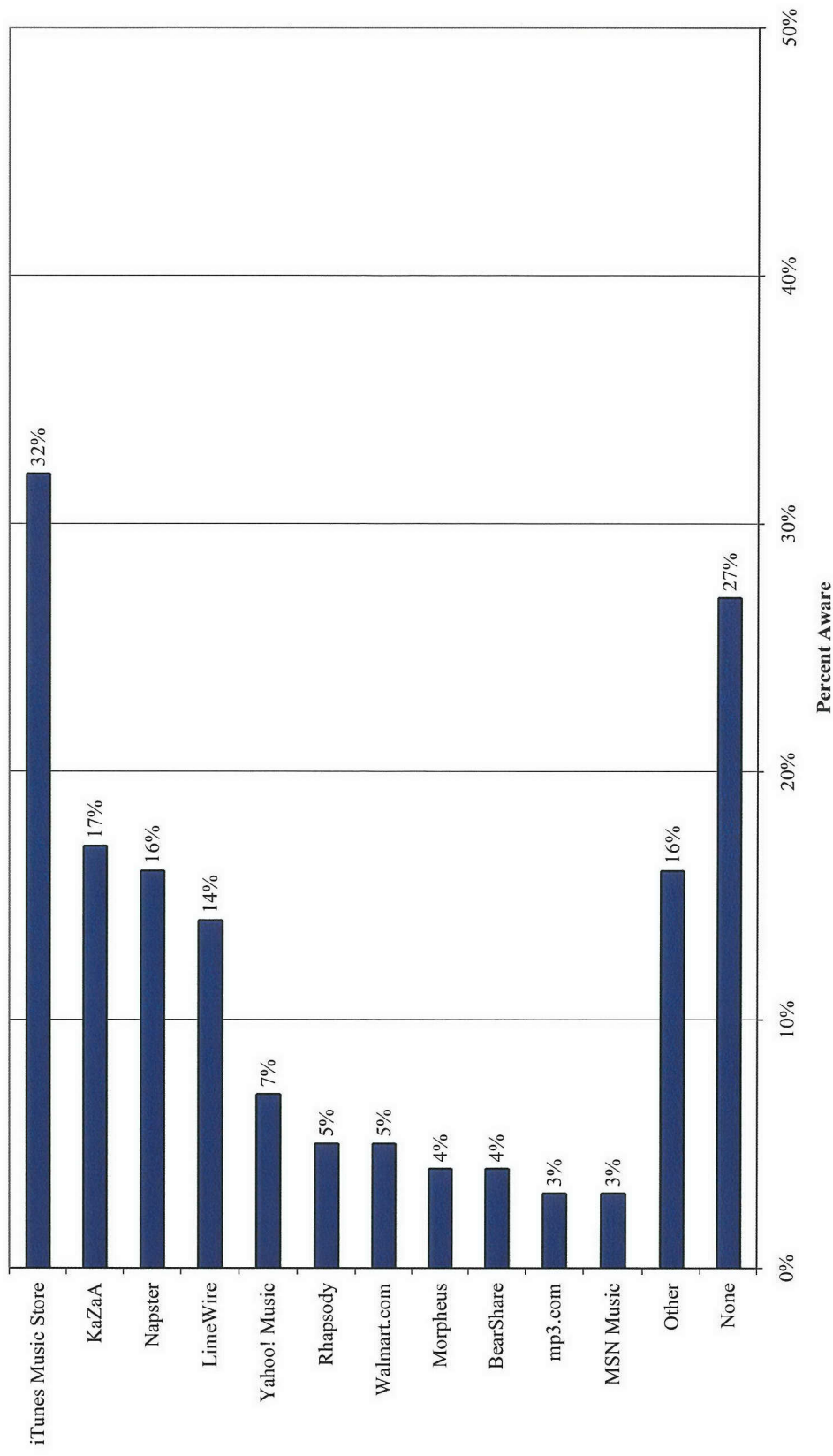
Source: TEMPO: Keeping Pace with Digital Music Behavior, Executive Summary, Oct. 2006

Reasons for Not Paying for Digital Music, 2006



Source: *TEMPO: Keeping Pace with Digital Music Behavior, Executive Summary, Oct. 2006*

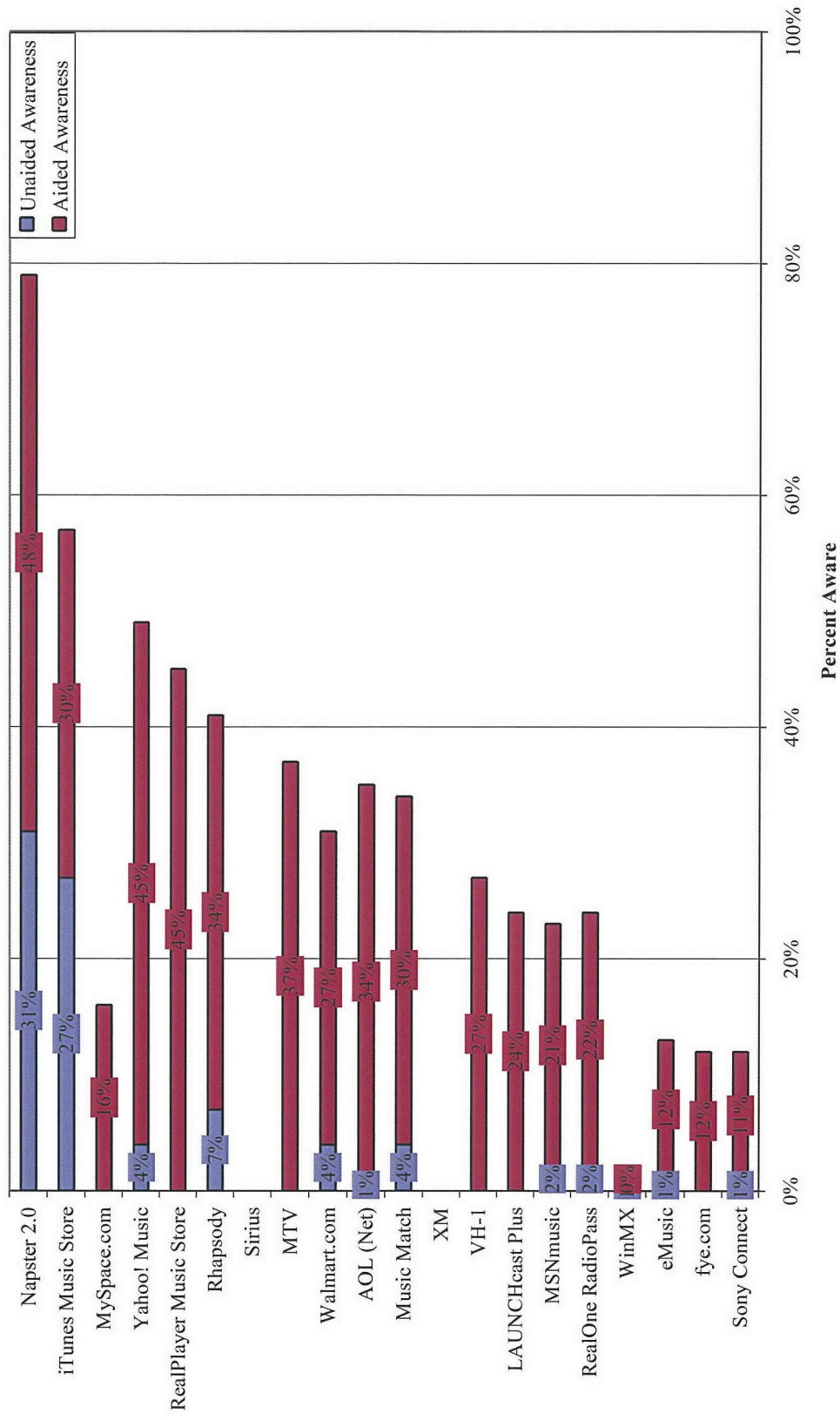
Unaided Awareness of Music Destinations & Fee-Based Service



Note: Data less than 3% is not shown.

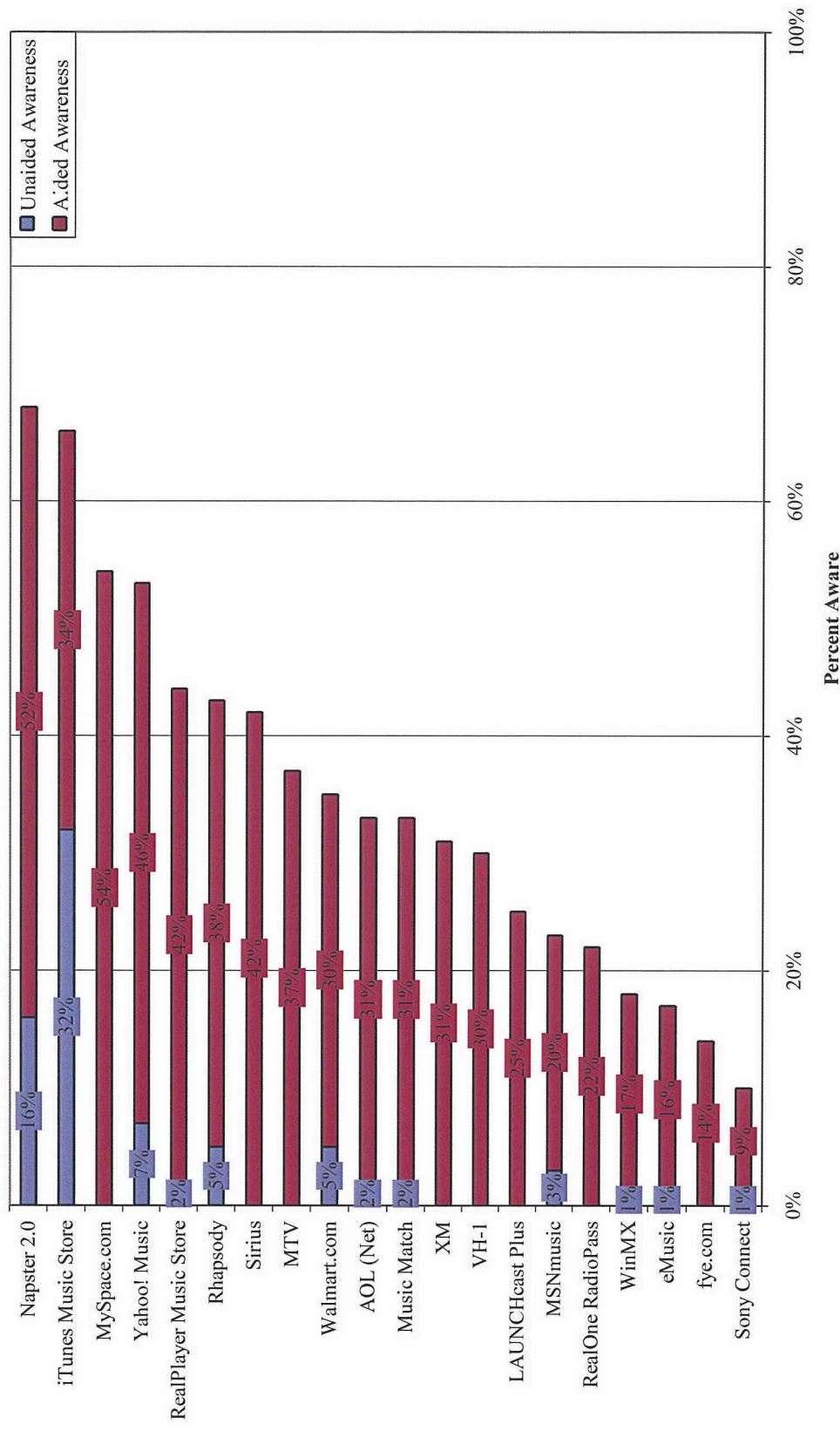
Source: "Tempo: Keeping Pace with Digital Music Behavior Awareness & Perceptions of Fee-Based Digital Music Service October 2006"

Total Awareness of Fee-Based Services: Q2 2005



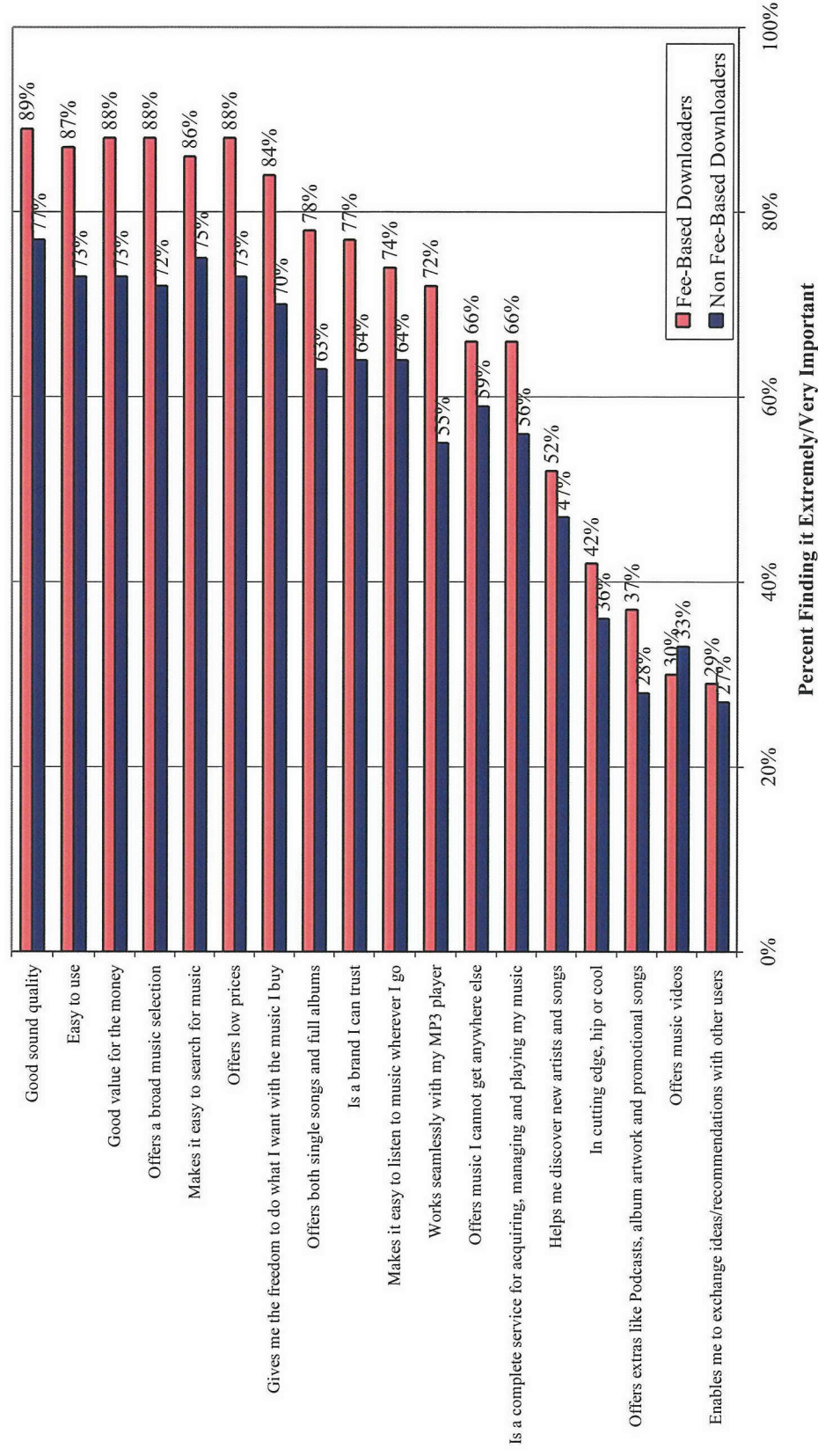
Source: "Tempo: Keeping Pace with Digital Music Behavior Awareness & Perceptions of Fee-Based Digital Music Service October 2006"

Total Awareness of Fee-Based Services: Q2 2006



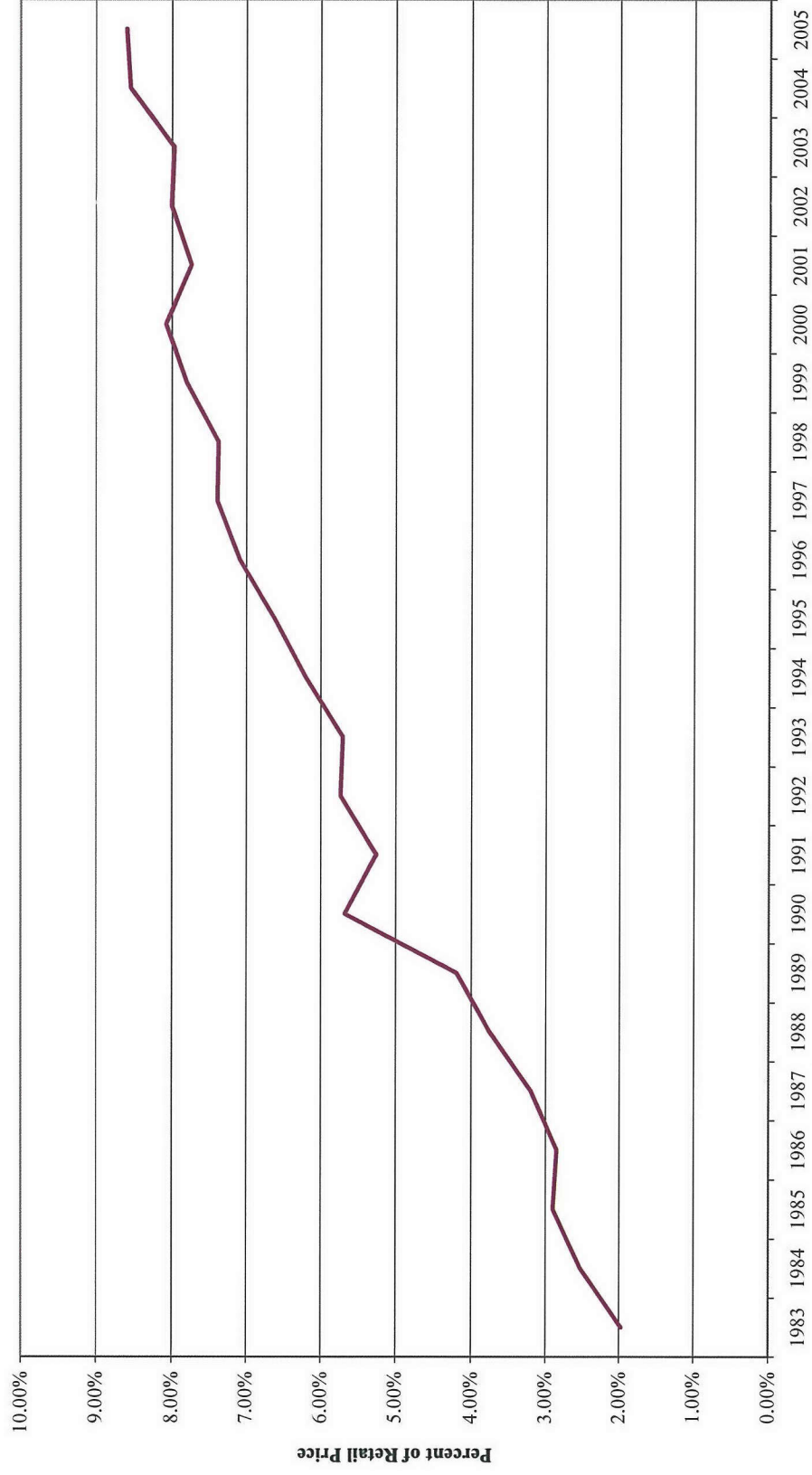
Source: "Tempo: Keeping Pace with Digital Music Behavior Awareness & Perceptions of Fee-Based Digital Music Service October

Importance of Fee-Based Service Attributes: Fee-Based Downloaders vs. Non Fee-Based Downloaders, Q2 2006



Source: "Tempo: Keeping Pace with Digital Music Behavior Awareness & Perceptions of Fee-Based Digital Music Service October 2006"

Percent of CD Retail Price Accounted for by Mechanical Royalties Over Time



Note: Mechanical Royalty Rate used for 1984 began in July of that year, songs per CD were estimated.

Sources: "Full-Length CD", "Mechanical royalty rates"

Table 8

DETERMINATION OF MECHANICAL ROYALTIES			
Country	Net Royalty	Method of Determination	Reported Phono-Mechanical Royalties (\$Millions)
Albania	7.5%-9% on the selling price of CDs, MC, etc.	ALBAUTOR	negligible
Argentina	8.19% of published price to dealer (ppd)	collective bargaining	17.97
Australia/N.Z.	9.306% of ppd or 5.73% of retail selling price (rsp)	collective bargaining	18.36
Austria	9.009% of ppd	BIEM-IFPI	9.03
Belgium	9.009% of ppd	BIEM-IFPI	24.61
Brazil	8.4% of ppd (on 90% of sales)	BIEM-FLAFF	N/A
Canada	7.1 cents per song or 1.42 cents per minute	collective bargaining	35.98
Chile	7.5 - 8.1% of ppd	collective bargaining	0.33
China	3.5% of ppd	MCSC	1.13
Cuba	-	-	N/A
Czech Republic	9.009% of ppd	-	2.97
Denmark	9.009% of ppd	BIEM-IFPI	36.24
Egypt	9.35% of retail selling price less 20% deduction	0.00	
Finland	9.009% of ppd	BIEM-IFPI	7.38
France	9.009% of ppd	BIEM-IFPI	96.04
Germany	9.009% of ppd	BIEM-IFPI	278.48
Greece	9.009% of ppd	BIEM-IFPI	3.62
Hong Kong	6.75% of ppd	CASH-IFPI; AMPS-IFPI	0.21
Hungary	9.009% of ppd	BIEM-IFPI	2.31
Iceland	9.009% of ppd	BIEM-IFPI	0.00
India	N/A	N/A	N/A
Indonesia	3% of ppd	Regional MOU	N/A
Ireland	8.5% of ppd	collective bargaining	N/A
Israel	9.009% of ppd	BIEM-IFPI	1.09
Italy	9.009% of ppd	BIEM-IFPI	51.42
Japan	6% of adjusted retail price (arp)	JASRAC; approved by govt.	170.84
Lithuania	9.009% of ppd	BIEM-IFPI	0.62
India	-	-	0.00
Malaysia	5.4% of ppd	Regional MOU	N/A
Mexico	8% of ppd (cassettes); 7.5% of ppd (CD)	collective bargaining	18.46
The Netherlands	9.009% of ppd	BIEM-IFPI	4.97
Norway	9.009% of ppd	BIEM-IFPI	12.31
Peru	5.25% of the rsp	BIEM-FLAFF	N/A
Philippines	4.5% of ppd	Regional MOU	0.05
Poland	9.009% of ppd	BIEM-IFPI	7.39
Portugal	9.009% of ppd	BIEM-IFPI	6.16
Republic of Croatia	7.4% of rsp	-	-3.26
Romania	9.009% of ppd	BIEM-IFPI	N/A
Russian Federation	9-10% of ppd	RAO	N/A
Singapore	5.4% of ppd; 5% of rsp	collective bargaining; set by statute	N/A
Slovak Republic	9.009% of ppd	collective bargaining	0.00
South Africa	6.75% of ppd; 5% of rsp	collective bargaining; set by statute	7.61
South Korea	5.4% of ppd; 7% of rsp	Regional MOU; KOMCA	10.83
Spain	9.009% of ppd	BIEM-IFPI	51.27
Sweden	9.009% of ppd	BIEM-IFPI	22.77
Switzerland	9.009% of ppd	collective bargaining	42.15
Taiwan	5.4% of ppd; 6.25% of rsp	Regional MOU; FAI	N/A
Thailand	3% of ppd	Regional MOU	N/A
Turkey	8% of a negotiated or deemed PPD	collective bargaining	5.96
United Kingdom	8.5% of ppd	MCPS; approved by royalty tribunal	278.85
Uruguay	6.08% of rsp	collective bargaining	0.00
USA	8.00 cents per song or 1.55 cents per minute	set by statute	552.70
Venezuela	N/A	N/A	0.32
Yugoslavia	7.4% of ppd	collective bargaining	0.00
Zimbabwe	N/A	N/A	negligible

EFFECT OF CONTINUATION OF PHYSICAL COMPULSORY LICENSE FEE ON DIGITAL DOWNLOADING AND SUBSCRIPTION BUSINESS MODELS

PRO FORMA Based on Current Royalty Scheme
(Assumes All Digital List Prices Held Constant at 2005 Level)

Download Business Models:

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Typical DL Price-Singles	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99	\$ 0.99
License Fee	\$ 0.085	\$ 0.091	\$ 0.091	\$ 0.093	\$ 0.093	\$ 0.096	\$ 0.096	\$ 0.098	\$ 0.098	\$ 0.101	\$ 0.101	\$ 0.103
License Fee as % of Revenues	8.6%	9.2%	9.2%	9.4%	9.4%	9.7%	9.7%	9.9%	9.9%	10.2%	10.2%	10.4%

Subscription Business Models:

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Typical Subscription Fee (monthly)	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95	\$ 14.95
Est. conditional download plays (1)	110	110	110	110	110	110	110	110	110	110	110	110
License Fee	\$ 0.085	\$ 0.091	\$ 0.091	\$ 0.093	\$ 0.093	\$ 0.096	\$ 0.096	\$ 0.098	\$ 0.098	\$ 0.101	\$ 0.101	\$ 0.103
License Fee as % of Revenues	67.0%	67.0%	67.0%	68.7%	68.7%	70.4%	70.4%	72.2%	72.2%	74.1%	74.1%	75.9%
Tracks downloaded to yield all revenues accruing to copyright owner	164	164	164	160	160	156	156	152	152	149	149	145

Physical CD Album Sales

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Average Price CD (2)	\$ 14.91	\$ 14.84	\$ 14.76	\$ 14.69	\$ 14.61	\$ 14.54	\$ 14.47	\$ 14.40	\$ 14.32	\$ 14.25	\$ 14.18	\$ 14.11
Average tracks per CD (3)	15	15	15	15	15	15	15	15	15	15	15	15
License Fee	\$ 0.085	\$ 0.091	\$ 0.091	\$ 0.093	\$ 0.093	\$ 0.096	\$ 0.096	\$ 0.098	\$ 0.098	\$ 0.101	\$ 0.101	\$ 0.103
License Fee as % of Revenues	8.6%	9.2%	9.2%	9.5%	9.6%	9.9%	9.9%	10.2%	10.3%	10.6%	10.6%	11.0%

NOTES:

- (1) Based on estimated average of about 110 per month
- (2) Based on RIAA statistics.
- (3) Based on current estimates

Assumes inflation increases at 2.5% annually based on CAGR of 2000-2005, applied every two years.
Assumes price of CDs declines at rate of 0.5 percent per year based on decline from 2003-2005.

Projected Mechanical Royalties
Based on JupiterResearch Forecast, 2005-2010
(\$ Millions)

Scenario 1: 4.1% purchase, 4% subscription royalties

	2007	2008	2009	2010
Physical Media				
Off-line	\$ 10,954	\$ 10,810	\$ 10,368	\$ 10,590
On-line	\$ 1,200	\$ 1,283	\$ 1,345	\$ 1,383
Total	\$ 12,154	\$ 12,093	\$ 11,713	\$ 11,973
Royalties (4.1%)	\$ 498	\$ 496	\$ 480	\$ 491
Digital Media				
Permanent downloads	\$ 777	\$ 874	\$ 966	\$ 1,066
Royalties (4.1%)	\$ 32	\$ 36	\$ 40	\$ 44
Subscription	\$ 613	\$ 850	\$ 1,071	\$ 1,237
CDLs at 25% of usage	\$ 153	\$ 213	\$ 268	\$ 309
Royalties (4%)	\$ 6	\$ 9	\$ 11	\$ 12
CDLs at 50% of usage	\$ 307	\$ 425	\$ 536	\$ 619
Royalties (4%)	\$ 12	\$ 17	\$ 21	\$ 25
CDLs at 75% of usage	\$ 460	\$ 638	\$ 803	\$ 928
Royalties (4%)	\$ 18	\$ 26	\$ 32	\$ 37
Total Digital Revenues	\$930-\$1,237	\$1,087-\$1,512	\$1,234-\$1,769	\$1,375-\$1,994
Total Digital Royalties	\$38-\$50	\$45-\$62	\$51-\$72	\$56-\$81

Scenario 2: 4.2% purchase, 4.1% subscription royalties

	2007	2008	2009	2010
Physical Media				
Off-line	\$ 10,954	\$ 10,810	\$ 10,368	\$ 10,590
On-line	\$ 1,200	\$ 1,283	\$ 1,345	\$ 1,383
Total	\$ 12,154	\$ 12,093	\$ 11,713	\$ 11,973
Royalties (4.2%)	\$ 510	\$ 508	\$ 492	\$ 503
Digital Media				
Permanent downloads	\$ 777	\$ 874	\$ 966	\$ 1,066
Royalties (4.2%)	\$ 33	\$ 37	\$ 41	\$ 45
Subscription	\$ 613	\$ 850	\$ 1,071	\$ 1,237
CDLs at 25% of usage	\$ 153	\$ 213	\$ 268	\$ 309
Royalties (4.1%)	\$ 6	\$ 9	\$ 11	\$ 13
CDLs at 50% of usage	\$ 307	\$ 425	\$ 536	\$ 619
Royalties (4.1%)	\$ 13	\$ 17	\$ 22	\$ 25
CDLs at 75% of usage	\$ 460	\$ 638	\$ 803	\$ 928
Royalties (4.1%)	\$ 19	\$ 26	\$ 33	\$ 38
Total Digital Revenues	\$930-\$1,237	\$1,087-\$1,512	\$1,234-\$1,769	\$1,375-\$1,994
Total Digital Royalties	\$39-\$52	\$46-\$63	\$52-\$73	\$58-\$83

Projected Mechanical Royalties
Based on JupiterResearch Forecast, 2005-2010
(\$ Millions)

<u>Physical Media</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>
Off-line	\$ 10,954	\$ 10,810	\$ 10,368	\$ 10,590
On-line	\$ 1,200	\$ 1,283	\$ 1,345	\$ 1,383
Total	\$ 12,154	\$ 12,093	\$ 11,713	\$ 11,973
Royalties (4.3%)	\$ 523	\$ 520	\$ 504	\$ 515
<u>Digital Media</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>
Permanent downloads	\$ 777	\$ 874	\$ 966	\$ 1,066
Royalties (4.3%)	\$ 33	\$ 38	\$ 42	\$ 46
Subscription	\$ 613	\$ 850	\$ 1,071	\$ 1,237
CDLs at 25% of usage	\$ 153	\$ 213	\$ 268	\$ 309
Royalties (4.2%)	\$ 6	\$ 9	\$ 11	\$ 13
CDLs at 50% of usage	\$ 307	\$ 425	\$ 536	\$ 619
Royalties (4.2%)	\$ 13	\$ 18	\$ 22	\$ 26
CDLs at 75% of usage	\$ 460	\$ 638	\$ 803	\$ 928
Royalties (4.2%)	\$ 19	\$ 27	\$ 34	\$ 39
Total Digital Revenues	\$930-\$1,237	\$1,087-\$1,512	\$1,234-\$1,769	\$1,375-\$1,994
Total Digital Royalties	\$39-\$52	\$47-\$65	\$53-\$76	\$59-\$85

Projected Mechanical Royalties
Based on IDC Forecast, 2007-2008
(\$ Millions)

Scenario 3: 4.1% purchase, 4% subscription royalties

	<u>2007</u>	<u>2008</u>
<u>Digital Media</u>		
Permanent downloads	984 \$	1,229
Royalties (4.1%)	40 \$	50
Subscription	833 \$	1,091
CDLs at 25% of usage	208 \$	273
Royalties (4%)	8 \$	11
CDLs at 50% of usage	417 \$	546
Royalties (4%)	17 \$	22
CDLs at 75% of usage	625 \$	818
Royalties (4%)	25 \$	33
Total Revenues	\$1,192-\$1,609	\$1,502-\$2,047
Total Digital Royalties	\$48-\$65	\$61-\$83

Scenario 4: 4.2% purchase, 4.1% subscription royalties

	<u>2007</u>	<u>2008</u>
<u>Digital Media</u>		
Permanent downloads	984 \$	1,229
Royalties (4.2%)	41 \$	52
Subscription	833 \$	1,091
CDLs at 25% of usage	208 \$	273
Royalties (4.1%)	9 \$	11
CDLs at 50% of usage	417 \$	546
Royalties (4.1%)	17 \$	22
CDLs at 75% of usage	625 \$	818
Royalties (4.1%)	26 \$	34
Total Revenues	\$1,192-\$1,609	\$1,502-\$2,047
Total Digital Royalties	\$50-\$67	\$63-\$86

Projected Mechanical Royalties
Based on IDC Forecast, 2007-2008
(\$ Millions)

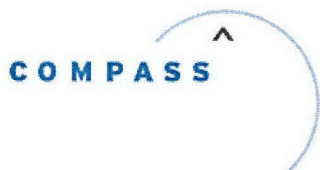
Scenario 2: 4.3% purchase, 4.2% subscription royalties

	<u>2007</u>	<u>2008</u>
<u>Digital Media</u>		
Permanent downloads	\$ 984	\$ 1,229
Royalties (4.3%)	42	53
Subscription	\$ 833	\$ 1,091
CDLs at 25% of usage	\$ 208	\$ 273
Royalties (4.2%)	9	11
CDLs at 50% of usage	\$ 417	\$ 546
Royalties (4.2%)	17	23
CDLs at 75% of usage	\$ 625	\$ 818
Royalties (4.2%)	26	34
Total Revenues	\$1,192-\$1,609	\$1,502-\$2,047
Total Digital Royalties	\$51-\$68	\$64-\$87

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**This exhibit contains restricted information that is
subject to a confidentiality agreement and has
been redacted from the publicly filed version**

C



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EDUCATION

- | | |
|------|--|
| 1976 | A.B., Economics, Brown University |
| 1979 | M.P.A., (Masters in Public Affairs), Woodrow Wilson School of Public and International Affairs, Princeton University |

PROFESSIONAL EXPERIENCE

- | | |
|--------------|---|
| 2003-present | President, Competition Policy Associates
(as of January 2006, also Senior Managing Director, FTI Consulting Inc.) |
| 1994-2003 | Principal, Economists Incorporated |
| 1990-1994 | Assistant Chief, Economic Regulatory Section, Economic Analysis Group, Antitrust Division, U.S. Department of Justice |
| 1987-1990 | Senior Economist, Economists Incorporated |
| 1986-1987 | Director of Analytical Resources Unit, Economic Analysis Group, Antitrust Division |
| 1985-1986 | Economist, Economic Analysis Group, Antitrust Division, U.S. Department of Justice |
| 1982-1985 | Economist, Financial Structure Section, Division of Research and Statistics, Board of Governors of the Federal Reserve System |
| 1979-1982 | Economist, Economic Policy Office, Antitrust Division, U.S. Department of Justice |
| 1976-1977 | Research Associate, Energy Economics Group, Arthur D. Little, Inc. |

TEACHING EXPERIENCE

- 1984 Adjunct Lecturer, Institute of Policy Sciences, Duke University
- 1984-1989 Executive Education for Top State Managers, conducted by The Institute of Policy Sciences, Duke University
- 1983 Lecturer, Board of Governors of the Federal Reserve System and American Institute of Banking
- 1979 Teaching Assistant, Princeton University

TESTIMONY

Investigation into the Competitive Marketing of Air Transportation, CAB

Arbitration Between First Texas Savings Association and Financial Interchange Network

In Re "Apollo" Air Passenger Computer Reservation System (CRS) MDL DKT. No. 760 M-21-49-MP

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Economic Report in Response to European Commission's Statement of Objections Dated 22 May 2003

European Commission Hearing, Case No Comp/E-2/37.533-Choline Chloride

Report of Robert D. Willig and Margaret E. Guerin-Calvert to the NZCC *An Economic Analysis of the Consumer Benefits and Competitive Effects of the Proposed Alliance Between Qantas Airways and Air New Zealand*

Report of Robert D. Willig and Margaret E. Guerin-Calvert to the NZCC *An Economic Assessment of Professor Tim Hazledine's Model of the Proposed Alliance Between Qantas and Air New Zealand*

Presentations by Robert D. Willig and Margaret E. Guerin-Calvert to the NZCC *An Economic Analysis of the Consumer Benefits and Competitive Effects of the Proposed Alliance Between Qantas Airways and Air New Zealand; Consumer Benefits*

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In the Matter of an Appeal from Determinations of the Commerce Commission, Between Air New Zealand Limited and Qantas Airways Limited and Commerce Commission, High Court of New Zealand, CIV 2003 404 6590

Economic Assessment of Issues in FERC NOPR for the Alaska Natural Gas Pipeline, December 17, 2004

In Re: DRAM Antitrust Litigation, Master File No. M-02-1486PJH, MDL No. 1486,
United States District Court, Northern District of California

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RESEARCH, PUBLICATIONS AND PRESENTATIONS

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Using Economic Experts.

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Janusz A. Ordoover, New York University and Competition Policy Associates), and also
at the Federal Reserve Bank of New York and the Review of Network Economics
conference on “Antitrust Activity in Card-Based Payment Systems: Causes and
Consequences,” September 15, 2005.

“The Role of the Economist/Economics in ‘Proving’ Coordinated Effects,” the Milton
Handler Annual Antitrust Review sponsored by the Association of the Bar of the City of
New York. Published in *Columbia Business Law Review*. 2004 Milton Handler Antitrust
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(CRS),” November 2003

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Policy, February – May 2003

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Counterclaims in Patent Infringement Lawsuits*, American Bar Association – Section of
Antitrust Law, Spring Meeting, April 2-4, 2003.

“Economic Analysis of DOT Proposals to Change the CRS Rules,” Appendix to Comments of Galileo International, (with I. Curtis Jernigan, and Gloria Hurdle), March 15, 2003.

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“U.S. Antitrust Law Developments,” *Canadian Competition Record*, Winter 2002-2003.

“What’s New in Networks?” *Antitrust Litigator*, Summer 2002.

“Competition and Innovation in the Context of Network Economics,” at the DOJ/FTC Hearings on Competition and Intellectual Property Law in the Knowledge-Based Economy, February 20, 2002.

“U.S. Antitrust Law Developments,” *Canadian Competition Record*, Winter 2001-2002.

“Review of Selected Economic Literature on Merger Analysis,” (with Stephanie Mirrow and Su Sun), July 2001. *Perspectives on the Concepts of Time, Change, and Materiality in Antitrust Enforcement*. Section of Antitrust Law, American Bar Association, (also presented at ABA Annual Meeting, August 2001).

“U.S. Antitrust Law Developments,” *Canadian Competition Record*, Winter 2000-2001.

“Presenting Damages Evidence” before the Practicing Law Institute, Antitrust Litigation: Strategies for Success, November 30, 2000.

“Overview of B2Bs: Which Ones Raise Antitrust Issues?” before the Sixth Annual Health Care Forum, Northwestern University School of Law, November 2-3, 2000.

“An Economist’s Perspective on B2Bs,” *Economists Ink*, Fall 2000.

“How Do the New Competitor Collaboration Guidelines Address the New Economy?” before the ABA, Antitrust Section, Joint Ventures and Strategic Alliances, November 11-12, 1999.

“The Role of the Expert in Damages Analysis” before the Practicing Law Institute, November 8, 1999.

“Bank Mergers and the 1992 Merger Guidelines: The Bank of America/Security Pacific Transaction,” (with Janusz Ordover), September 1999 (prepared for presentation at the 25th Anniversary of the Economics Analysis Group at the US Department of Justice). *Review of Industrial Organization*, 16: 151 – 165, 2000.

“Maximizing current and future network competition in payment systems” (with Janusz Ordovery) before the American Bar Association, Antitrust Section, Antitrust Issues in High-Tech Industries Workshop, Scottsdale, AZ, February 25-26, 1999.

Supplemental Analysis of “Inherent Reasonableness” Survey, prepared for HIMA (with Matthew Mercurio); February 1999.

Report on DMERC “Inherent Reasonableness” Survey, prepared for HIMA (with Matthew Mercurio); November 1998.

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“Networks and Network Externalities: What the Antitrust Lawyer Needs to Know: Concepts and Theory,” before the American Bar Association, Antitrust Section, 45th Annual Spring Meeting, Washington, DC, April 10, 1997.

“Insights into Efficiencies from Analyses of Efficiencies in Hospital and Bank Mergers,” before the American Bar Association, Antitrust Law Section, Washington, DC, November 7-8, 1996.

“Issues in Managed Care “Markets,” before the American Bar Association Forum on Health Law and Antitrust Law Section (with Robert B. Greenbaum), New Orleans, Louisiana, October 24-25, 1996.

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“ATM and Bank Electronic Networks: Competitive Issues and Technological Change,” for presentation at the 71st Annual WEA International Conference, June 29, 1996.

“Assessing the Implications of Kodak for Franchise Market Power Issues,” before the American Bar Association, Antitrust Law Section, Spring Meeting, Washington, DC, March 27, 1996.

“Current Merger Policy: Banking and ATM Network Mergers,” before the OCC Conference, November 1995.

“Economists and Empirical Analysis in the Merger Review Process: Beyond Market Share and HHI Calculations,” before the American Bar Association, Antitrust Law Section and the International Bar Association Antitrust and Trade Law Committee, Washington, DC, November 9-10, 1995.

“Network Merger Analysis,” for presentation at the 43rd Annual American Bar Association, Antitrust Law Section, April 6, 1995.

"Assessing the Implications of Bank Merger Transactions after Interstate Banking and Branching Legislation: Lessons to Be Drawn From Bank Merger Cases and Analysis in the '90's," for presentation at ACI Third Annual Bank Regulation Conference, Washington, DC, March 16, 1995.

"Key Issues in Antitrust Analysis of Bank Mergers in the 1990's," for presentation at the Bank Mergers and Acquisitions Program Practicing Law Institute, September 12-13, 1994.

"Economic Issues in Network Merger Analysis," for presentation at Mergers: The Cutting Edge before the American Bar Association, 1994 Annual Meeting, New Orleans, August 9, 1994.

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"The 1992 Agency Horizontal Merger Guidelines and the Department of Justice's Approach to Bank Merger Analysis," *Antitrust Bulletin*, Vol. XXXVII, No. 3, Fall 1992, (with Janusz Ordover).

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"Computer Reservations Systems and their Network Linkages to the Airline Industry," in *Electronic Services, Networks: A Business and Public Policy Challenge*, Praeger, 1991, (with R. Noll).

"Electronic Services Networks Functions, Structures, and Public Policy" in *Electronic Services Networks: A Business and Public Policy Challenge*, Praeger, 1991, (with S. Wildman).

"New Developments in Airline Merger Analysis: Changes in the Industry and the Evidence," *Regulatory Reform*, January 1988.

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"Current Issues in Airline Mergers," presented at the Stanford Conference on Firm Ownership and Competition, June 19-20, 1987.

"The 1982 Department of Justice Guidelines: Applications to Banking Markets," *Issues in Bank Regulation*, Winter 1983, reprinted in T. Havrilesky, R. Schweitzer, and J. Boorman, ed. *Dynamics of Banking*, Harlan Davidson, Inc., 1985.

Department of Justice, *Report to Congress on the Computer Reservations Industry*, December 1985.

"New Rules of the Game: Modifying Bank Merger Analysis to Account for Regulatory Changes," presented at the Association of Public Policy and Management Conference, New Orleans, October 1984

"The Determinants of Thrift Institutions' Commercial Lending Activity," *Chicago Bank Structure and Competition Compendium*, September 1983, (with C. Dunham).

"How Quickly Can Thrifts Move into Commercial Lending?" *New England Economic Review*, November/December 1983, (with C. Dunham).

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National Benefits/Costs of Enhanced Oil Recovery Research Final Report, Arthur D. Little, Inc., submitted to the Energy Research and Development Administration, August 1976, (with F. Mansvelt-Beck and T. Rothermal)

OTHER PROFESSIONAL ACTIVITIES

Co-Chair of the Membership Committee, Member Economic Evidence Task Force, Member Advisory Board on Section Reserves, Antitrust Section, American Bar Association

Member, American Economics Association

PAST PROFESSIONAL ACTIVITIES

Chair, Interagency Task Force on Bank Competition (at the U.S. Department of Justice, Antitrust Division)

Chair of the Exemptions and Immunities Task Force, Council Member, Chair, Financial Markets and Institutions Committee, Antitrust Section, American Bar Association